May 1984
Vol. 10, No. 5
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POWER LINE PROTECTION

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In-Depth Evaluations:

- Wang Professional Computer
- Morrow Micro Decision
- Juki Printer
- Roland Compu-Music 800
- Flexidraw Light Pen
- Rana Disk Drives
- Einstein Memory Trainer
- Keyport 717
- Gold Letters
- Family Roots
- Educational Software
- 13 New Games

Tutorials:

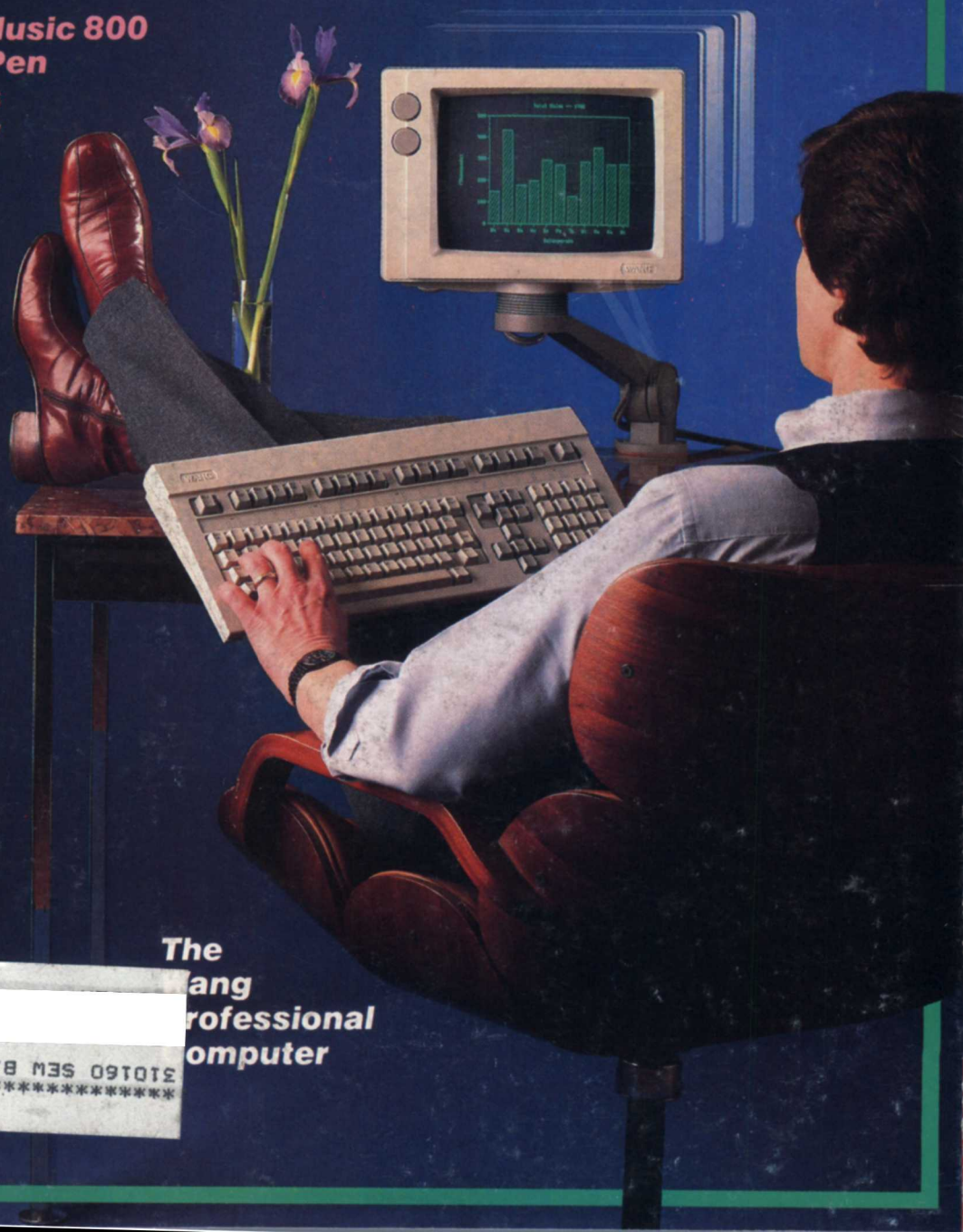
- Structured Programming In Basic
- MSX Graphics

Low Cost Word Processors For IBM And Apple

Math And Computer Art

MiniDOS For Commodore 64

College By Wire



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THINGS IN GENERAL:

In a nutshell, Leading Edge® is big word processing for the small computer.

It's the simplest, yet most powerful word processing program ever created for sophisticated Personal Computers like the IBM® (or the even more-powerful Leading Edge PC).

You can learn the basics of the system in a matter of minutes, master it in a matter of hours, and never outgrow it in a lifetime.

If you've been using another word-processing package, either you've been working too hard, or it hasn't been working hard enough.

Thanks to this program, even the most complex functions are typically reduced to just one or two keystrokes. And thanks to an impeccably logical and easy-to-reference Operator's Manual, you can quickly flip to any function you want to perform, and immediately start performing it.

So you can hunt and peck your way into the future, or (if you're already a good typist) . . . you can fly.

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THINGS THAT MAKE IT SIMPLE

A MANUAL THAT'S A HELP, NOT A HINDRANCE

An elegantly logical User's Manual written by non-technical writers, tested on beginners and experts alike, with simple, intelligent illustration, examples, and instructions, tab-indexed for instant access to any word-processing function.

SIMPLE LEARNING AIDS TAILORED TO YOUR ABILITY

Learning is easy—and actually fun—at every level, beginning with a Beginners' Guidebook and an interactive training disk that gives you on-screen instructions and holds your hand as it walks you through the basics step by step. After that, there's a "shorthand" cue card and keyboard overlay that refresh your memory at a glance. Most people start to do basic word-processing in less than one hour.

THE MOST HELPFUL "HELP" KEY YOU'LL EVER PRESS.

Gives you exactly the information you want, whenever you want it.

CLEAR, HELPFUL MENUS

Type two keys, and your screen gives you a "table of contents"—to let you "call-up" anything you've written, so you can revise it, update it, discard it, or print it.

BYPASS THE MENU

The menus are there if you want them. If you don't, fly nonstop to what you want using the menu bypass.

SIMPLE COMMANDS

Simple one- and two-keystroke commands mean you have no complicated codes to memorize.

LOGICAL DESIGN

So logical that when you know how one thing works, you know how a dozen other things work.

DESIGNED SPECIFICALLY FOR THE IBM OR LEADING EDGE PC KEYBOARD AND COMPUTER

To take advantage of all the power these PC's are capable of, with the greatest amount of simplicity.

THINGS THAT MAKE IT FAST

THE FASTEST CURSOR MOVES IN WORD PROCESSING

More moves with fewer keystrokes than any other system at any price. You can instantly move to the next character, next word, next sentence, the next line, the next page, or to the end of an entire document.

GO TO ANY PAGE INSTANTLY

Just tell Leading Edge Word Processing what page you want, and you get it

"DO IT" KEY MAKES BIG CHANGES WITH ONE KEYSTROKE

The simplest, fastest way to insert, delete, and move big blocks of text. (This is the "execute," or "plus" key on the IBM or Leading Edge PC.)

CHANGE A FORMAT IN SECONDS

Without leaving page or letter or memo or other document you're working on, you can see how it would look with different margins, indented, or in all capital letters; or with boldface headings, etc.

BLOCK INDENT

You don't have to hit the tab key on every line to create a temporary margin. (Great for columns of figures, sub-paragraphs, outlines, etc.)

DIRECT-DIAL DOCUMENTS FROM THE DIRECTORY

Just highlight the document you want (using the cursor keys), and you'll get it, simply by hitting the execute key.

HOT PRINT

Print any portion of a document, from one line to an entire document.

DOT LEADER TAB

Useful for things like tables of contents.

TRANSPOSE KEY

Corrects the most common mistake in typing: One stroke turns "teh" into "the."

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THINGS THAT MAKE IT EASY

ONE-KEY INSERT AND DELETE
Lets you do word processing's two most common functions the simplest possible way.

MARGIN AND TAB SETTINGS AS EASY AS ON A TYPEWRITER
No other word-processing system of any size makes it this easy. You can even adjust both left and right margins on-screen.

THE SCREEN SHOWS YOU WHAT YOU'RE GETTING
You don't have to wait until it's printed. You see margins, line breaks, underlines, page breaks, etc., as they will appear.

JUSTIFIED, OR RAGGED-RIGHT
And see it on the screen the way it'll appear when it's printed.

ANY NUMBER OF FORMATS IN A SINGLE DOCUMENT
Order different margins, tabs, line-spacing—anything—for any section of a document.

HEADERS AND FOOTERS OF ANY LENGTH
The document name, page number, or other information is printed automatically at the top or bottom of any page, or every other page, or wherever.

PRINT ANY PAGE IN THE FILE
You don't have to print a whole document. Just punch in the page number.

HARD PAGE BREAK
Lets you tell the system where you want pages to break.

HARD AND SOFT SPACES AND HYPHENS
You can tell the program which words must go together on the same line, which words must be hyphenated.

WIDOWS AND ORPHANS
The system automatically breaks pages to avoid leaving unsightly single lines or partial paragraphs at the bottom or top of a page—unless you want them there.

FRACTIONAL LINE SPACING
1½-line spacing is as easy to order on Leading Edge Word Processing as on a typewriter.

TEXT THAT'S WIDER THAN THE SCREEN
Horizontal scrolling allows you to create documents up to 200 characters wide.

THINGS THAT MAKE IT PROFESSIONAL

ONE-KEY CUT AND PASTE
Lets you move pieces of text around like matchsticks with far fewer keystrokes than other systems.

ONE-KEY CENTERING
And the line (or block of type) stays centered even when you change it.

AUTOMATIC REFORMATTING
You don't have to clean up a paragraph after you edit it. Leading Edge Word Processing does it for you.

THE BEST UNDERLINE YOU CAN BUY
As easy as a typewriter. And it shows on the screen as an underline.

BIG-SYSTEM BLOCK FUNCTIONS
Leading Edge Word Processing deletes, inserts, and performs other changes on large blocks of text through the use of forward and backward highlighting.

SCRATCH PAD
Gives you "scrap paper" in the middle of a document for working on text. When you're finished, you can insert the text, discard it, or even cut it out and paste it somewhere else.

NAME DOCUMENTS THE WAY YOU WANT
No codes needed. You can call a letter to Mom "Letter to Mom."

SPLIT SCREEN/WINDOWS
This big-system feature puts two documents on the screen at the same time so you can copy from one to another.

BOLD, SUBSCRIPTS, SUPERSCRIPTS, STRIKETHRU, AND LETTERS DOUBLE-WIDE
You get to see them on the screen, and you don't have to go through a big rigamarole to get them.

U.S. AND FOREIGN DECIMAL TABS
Automatically line up the decimal in its proper place in a column of numbers.

THINGS THAT GIVE YOU PEACE

A REAL LIVE PERSON
In the unlikely event that your system ever "crashes," or you need help with any feature or function, there's a toll-free hot-line that connects you to an expert tele-diagnostician who can give you an instant answer. 1-800-523-HELP—in Massachusetts, 617-449-6060.

AUTOMATIC SAVE
While you are editing, or creating a document, Leading Edge Word Processing automatically makes a copy every 15 seconds. So your work is saved, even if the power fails.

AUTOMATIC DOCUMENT BACKUP
Every document is automatically copied twice onto your file disk, if you choose to do so. So if an accident happens to one document, you still have a copy. (Don't worry. Your writing's not going to get lost in some electronic blackhole.)

RECALL OF DELETED TEXT
If you delete text by accident or change your mind, you can get it back.

CUSTOMER PROTECTION PLAN
Your Leading Edge Word Processing is guaranteed forever. If you should accidentally destroy it, we'll replace it at a nominal cost. Whenever we upgrade it, we'll give you an updated program at a nominal cost.

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One pass native code compiler	YES	NO	NO
Locates RunTime errors directly in source code	YES	NO	NO

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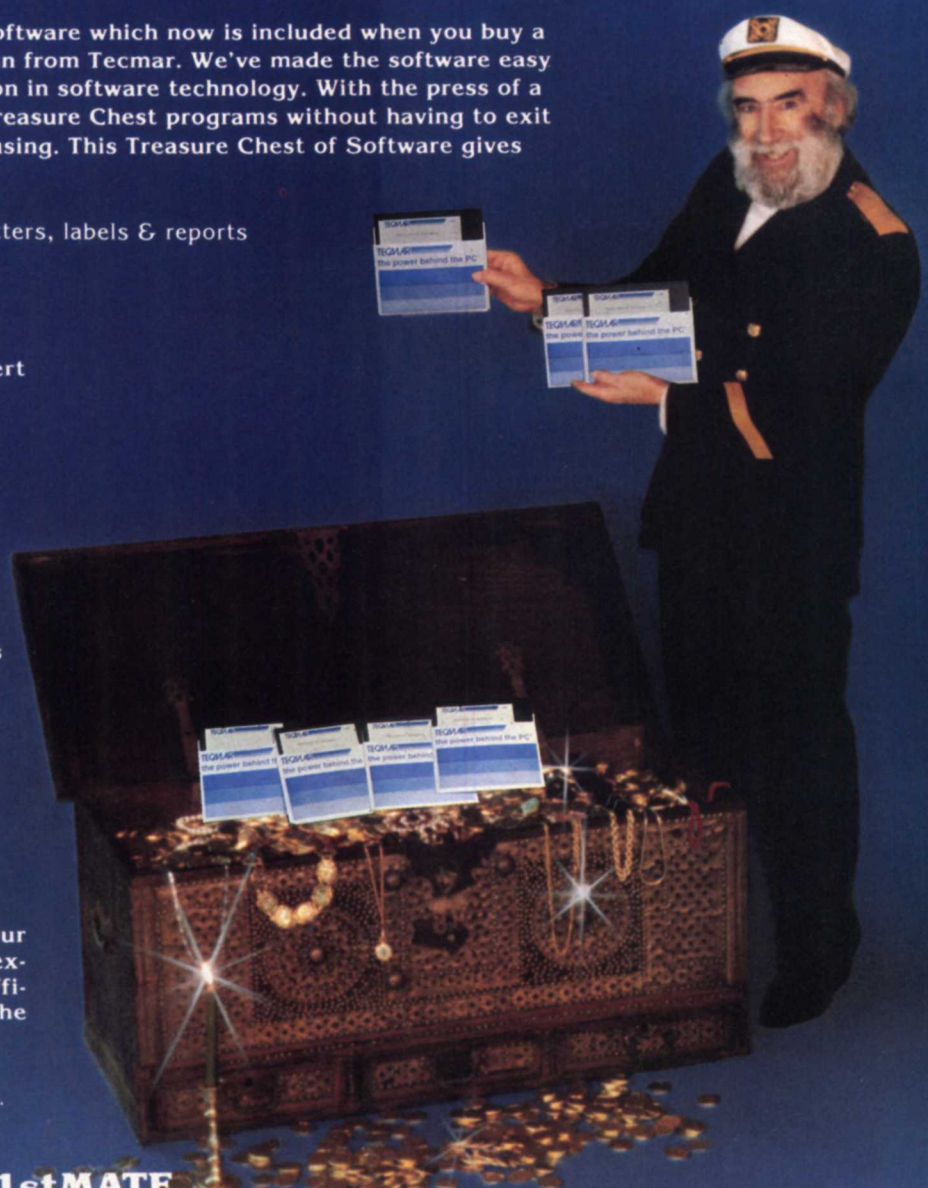

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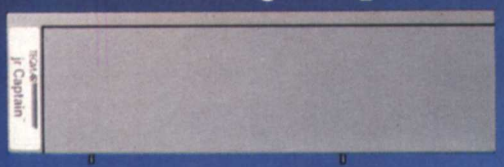

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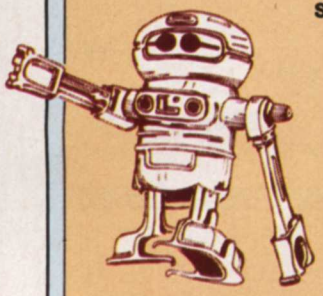

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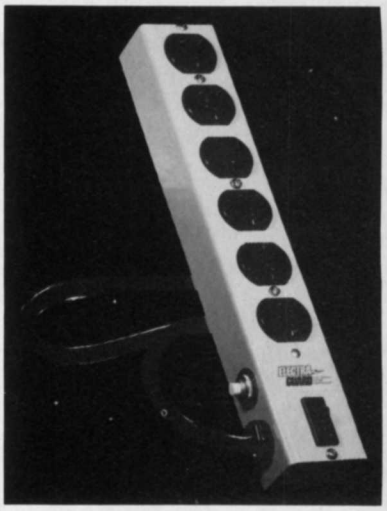

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Creative Computing Benchmark

The Creative Computing benchmark is a short test of computational speed, accuracy, and the random number generator in Basic. Computers in the chart are listed in ascending order of completion time of the test expressed in minutes and seconds. In the accuracy measure, the smaller the number the better (.0000001 is excellent while .187805 is poor). In the randomness measure, smaller is better (numbers under 15 are good and over 15 are fair).

Since running the short article about the benchmark test, we have been overwhelmed with responses from readers who ran the test on machines not listed in our original table. With letters still pouring in, here are the results for 183 different computers.

We have taken note of the criticisms of this simple test and are in the process of devising a more comprehensive one. Watch for a follow-up article.—DHA END

```
10 ' Ahl's Simple Benchmark
20 FOR N=1 TO 100: A=N
30 FOR I=1 TO 10
40 A=SQR(A): R=R+RND(1)
50 NEXT I
60 FOR I=1 TO 10
70 A=A^2: R=R+RND(1)
80 NEXT I
90 S=S+A: NEXT N
100 PRINT ABS(1010-S/5)
110 PRINT ABS(1000-R)
```

Computer	Time	Accuracy	Random
Cray 1	0:00.01	.0000000014	6.1
Amdahl 470	0:00.04	.00000000011846	12.4
Harris H-1000	0:00.06	.000003810971975	0.9
IBM 370/67	0:00.08	.000000000345835	4.6
Control Data Cyber 855	0:00.09	.00000000354703	6.1
Harris H-800	0:00.14	.000004418194294	0.9
DEC System 10	0:00.18	.00494385	8.9
DEC VAX 11/780	0:00.28	.00113525	5.3
Burroughs B6810	0:00.82	.0000850856304	21.6
DEC VAX 11/780 (double)	0:01.5	.000000000163283	5.3
DEC PDP 11/44	0:01.8	.000000000160298	2.4
DEC PDP 11/70 (RSTS)	0:02	.000000000160298	15.8
IBM PC (Basic87)	0:02	.000000000000682	87.3
Prime 550	0:02	.000000072876	12.2
HP 9845B (390 bit slice)	0:03	.00000882	23.1
Control Data Cyber 730	0:03	.00000000354703	6.1
HP 3000/44, single pre.	0:04	.112549	6.0
HP 3000/44, double pre.	0:05	.0000000000271996	9.4
HP 9836	0:05	.000000000127329	5.5
Control Data 3500	0:05	.001302457	2.8
Wang 2200 SVP	0:05	.000000076	3.9
Alpha Micro AM 1000E	0:05	.000000936911	12.4
IBM PC (Compiled Basic)	0:06	.01159668	20.4
DEC PDP 11/44 (RSTS)	0:07	.000000000158025	11.5
IBM S/38, model 7	0:07	.000000000008185	4.6
Wang PC	0:07	.005859375	7.2
Tandy Model 2000	0:07	.005859375	7.2
Data General Eclipse	0:08	.000000000345835	1.1
Eagle 1600	0:08	.005859375	7.2
Stearns Micro	0:08	.005859375	7.1
Burroughs B20	0:09	.005938744544977	3.2
Symbolics 3600	0:09	.111328125	8.5
DEC PDP 11/24	0:09	.000000000160298	9.9
Alpha Micro AM 100T	0:10	.00000387337	12.4
DEC Professional 350	0:11	.000000000602967	15.8
HP 9825	0:11	.00000882	9.1
NorthStar 8/16	0:11	.005859	7.2
Burroughs B22	0:12	.005859375	15.7
NEC Adv Pers Comp	0:12	.005859375	7.2
Tektronix 4054	0:12	.000000014042598	8.5
Olivetti M20	0:13	.0114136	6.2
Apple w/Saybrook 68000	0:13	.00000000011	10.4
TI Professional	0:15	.005859375	7.1
Compaq	0:15	.005859375	7.1
HP 150	0:15	.005859375	7.1
HP 9845B	0:15	.00000882	23.1
Zenith Z-100 (8088)	0:17	.005859375	9.7
Samurai S16	0:17	.01159668	6.3
ACT Apricot	0:18	.005859375	7.2
Canon AS-100	0:18	.005859375	7.2
Corona PHD	0:18	.005859375	7.2
Sharp PC-5000	0:18	.005859375	7.2
IBM 34 (short precision)	0:18	.1967	25.2
Eagle PC-2	0:19	.005859375	7.2
Apple w/uspeed	0:19	.041015624	8.0
Victor 9000	0:20	.005859375	7.2
DEC Rainbow 100	0:20	.005859375	7.2
Acorn BBC Computer	0:21	.0000128746033	5.2
Columbia MPC	0:21	.005859375	7.2
Computer Devices DOT	0:22	.005859375	7.1
Apple II w/ALF 8088	0:24	.00007558	10.4
IBM PC	0:24	.01159668	6.3
LMI CADR	0:24	.000202178789551	8.6
Monroe EC8800 (single)	0:27	.247559	10.8
GCE Vectrex	0:33	.0753174	0.9
Apple II, Titan Accel	0:33	.0010414235	4.5
Sharp MZ-80A	0:35	.00022172928	8.6
TI DS990/12 (Mini TS)	0:36	.0000000388	3.1
Lanier/AES 7200, C20	0:38	.04	4.0
Laser 2001	0:40	.00003272295	17.4
CompuPro (8085)	0:41	.187805	7.4
Monroe EC8800 (double)	0:42	.000000000060282	10.8
Epson QX-10	0:42	.0670776	7.5
Memotech MX-512	0:46	.00025296211 2	6.9
Coleco Adam	0:47	.000426292419	6.2
HP 9020C	0:48	.000000000127329	23.2
Grid Compass	0:48	.00000000000068	2.3
Lobo Max-80	0:48	.0338745	5.8
Lynx	0:51	.155	14.1
TRS-80 Model 4	0:53	.0670776	6.5
Panasonic JR200	0:57	.00021481514	15.1
SCS 100	0:59	.187805	7.4
IMS 8000	0:59	.187805	9.6
Alspa ACI-1	0:59	.187805	7.4
DECmate II	0:59	.187805	7.4
Xerox 820-II	0:59	.187805	7.4
Midwest Sci 6800 (SDOS)	0:59	.014842	0.6
Morrow Micro Decision	1:00	.187805	7.4
CCS 2210	1:00	.187805	7.4
Access Matrix (Actrix)	1:00	.187805	7.4
Heath H-8, Trionyx Z80	1:02	.187805	3.1
IBM 34 (long precision)	1:02	.000000001307	16.2
Vector Graphic 3 VIP	1:04	.0338745	7.5
Zenith Z-100 (8085)	1:04	.187805	9.5
Micromation Mariner	1:05	.187805	7.4
HP 125	1:08	.187805	7.4
Toshiba T100	1:09	.187805	7.4
Epson QX-10, MBasic	1:09	.187805	7.4
Osborne 01	1:10	.187805	7.4
TRS-80 Model II	1:11	.187805	3.1
ModComp Zorba 200	1:11	.187805	7.5
Mattel Aquarius	1:17	.187805	10.0
Heath H-89A (Basic-80)	1:17	.0670776	7.5
Epson QX-10	1:18	.187805	7.4
Lanier/AES Typemaster	1:18	.187805	7.4
HP-85A	1:20	.00000002	14.3
OSI Challenger 1P	1:20	.32959	5.5
Morrow MD3 (Bazic 10)	1:21	.000473	3.6
Lanier/AES 7100	1:24	.187805	7.4
HP-86A, B	1:25	.00000002	13.6
Tektronix 4051	1:26	.000000014042598	8.1
Digital Group Bytemaster	1:27	.000002779	3.6
NEC PC-8001A	1:29	.0338745	3.0
Onyx C8001/MU	1:30	.000002779	3.6
Sanyo MBC 550	1:30	.0626221	3.6
Atari 800, 1200 (MBasic)	1:35	.150879	2.1
OSI C8P-DF	1:35	.00104141235	18.6
Heath H-8	1:35	.00561523	2.7
Apple Macintosh (db1)	1:36	.0000000458	4.2
Kaypro II	1:36	.187805	7.5
Sony SMC-70	1:37	.0000000458	3.8
HP-75C	1:38	.00000002	5.8
North Star Horizon(10 dig)	1:41	.000473	3.6
NEC PC-8201	1:44	.187805	9.3
Exidy Sorcerer	1:47	.0338745	13.2
MicroOffice RoadRunner	1:48	.187805	7.4
Teleram 3000	1:48	.187805	7.4
Apple III	1:48	.011914	6.7
Vic 20	1:49	.00104141235	23.7
Commodore SuperPET	1:50	.000209331512	20.4
HP 9830B	1:52	.00000889	13.1
Commodore 64	1:53	.00104141235	8.9
Apple IIe, II+	1:53	.00104141235	12.0
Franklin Ace 1000, 1200	1:53	.00104141235	12.0
NEC PC-8801A	1:54	.187805	7.4
Rockwell Aim 65	1:56	.00104141235	14.7
Compucolor II	1:57	.0338745	1.4
TRS-80 Model III	1:59	.0338745	5.8
Micro Color Computer	1:59	.000596284867	7.6
Commodore CBM 8032, 2001	2:01	.00104141235	1.4
Heath/Zenith H-89A	2:04	.187805	7.4
Atari 2600 Graduate	2:15	.000224679708	7.9
TRS-80 Model I	2:19	.0338745	12.0
Color Computer	2:23	.000596284867	7.3
Atari 800 (fastchip)	2:23	.006875	7.0
Dragon 32	2:29	.000596284867	7.3
Epson HX-20	2:36	.0338745	23.8
DAI	2:38	.210266	9.6
Timex/Sinclair 1000 (fast)	2:43	.00041294098	8.7
Interact Model R	2:50	.0338745	8.1
Wang 2210	2:52	.000011432	12.5
OSI Challenger 1	3:07	.00104141235	13.9
Lanier/AES Superplus	3:30	.187805	7.4
SpectraVideo 318/328	3:40	.0000002058	0.7
TI 99/4A	3:46	.00000011	2.6
Radio Shack PC-3	4:00	.00000627	10.9
TI 99/4A, Extended	4:10	.00000011	10.7
Oric-1	4:10	.00104141235	12.1
Datapoint 1800	4:16	.00000012042	11.3
Sinclair ZX81	4:23	.00006685257	6.3
Sinclair Spectrum	4:39	.00006685257	3.5
TRS-80 Model 100	4:54	.0000002058	0.7
Timex 2068	4:55	.00006876411	12.8
Casio FP-200	5:05	.00723	30.3
Sharp PC-1500 (RS PC-2)	5:10	.00000288	7.8
Cromemco C-10	5:18	.00000001	16.1
TI CC-40	5:41	.00000011	6.2
Sanyo PHC-25	5:41	.00267505646	10.2
Franklin 1200 (CBasic)	5:47	.0000000744	14.3
Canon X-07	6:03	.0000002058	24.9
Atari 1200XL	6:45	.013959	5.2
Atari 400/800	6:48	.012959	22.8
Casio FX-702P	9:32	.00000627	3.5
Sharp EL-5500	9:55	.00000288	7.2
Sharp PC-1250	11:14	.00000288	5.9
Magic	11:45	.0000000744	---
Midwest Sci 6800	13:48	.1597	11.5
Timex/Sinclair 1000(slow)	16:55	.00041294098	7.4
IBM System 23	18:48	.00000005503	3.4
HP-97	23:00	.000034	---
Sharp PC-1211	28:32	.00002882	---
Central Data 2650	82:31	.033526	4.6
TI SR-50 (Calculator)	12.7 days	.193704289	16.4

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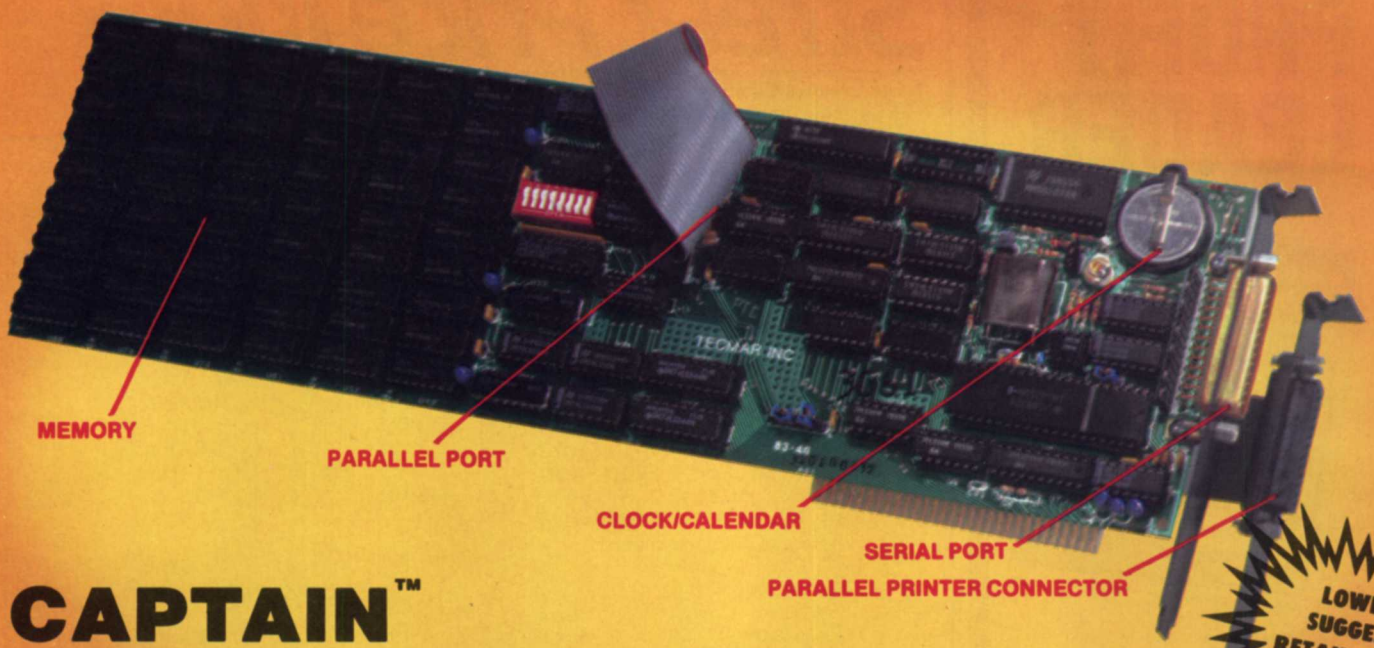

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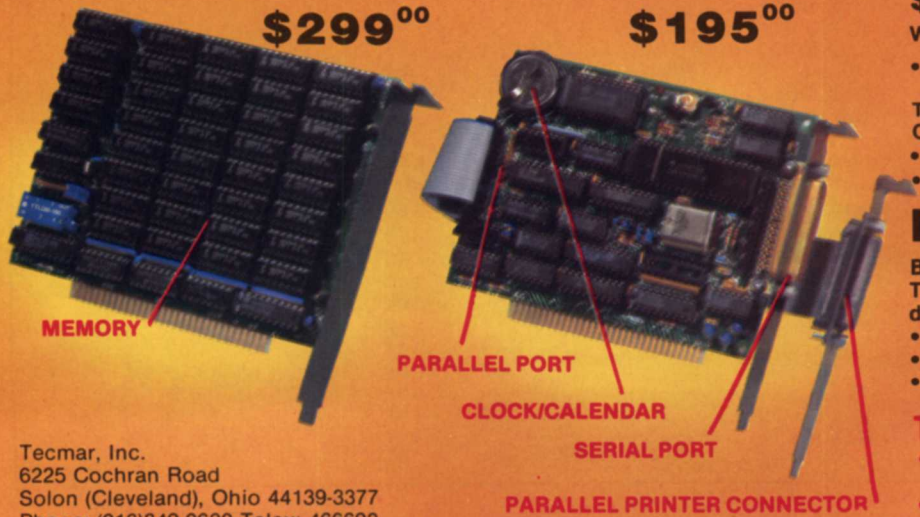

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The Creative Computing Street Price Index is an on-going monitor of the prices of selected computers, peripherals, and software packages.

This Index is not meant to be a purchasing guide. We emphatically do not recommend that you purchase a product based on price alone. Equally important are customer service, delivery, warranty, return policy, and provision for maintenance.

Some of the prices in the Index were obtained with the cooperation of Computer Price Alert, a newsletter which lists comparative prices on 300 items per issue. Annual subscription price (20 issues) is $48 from Computer Price Alert, P.O. Box 574, Cambridge, MA 02138.

Computer	List	Mar. 1984 Lowest
Apple IIe (starter)	$1995	$1349
Atari 600 XL, 16K	199	149
Atari 800 XL	299	200
Commodore 64	595	139
Eagle PC-2, 128K, 2 dr	3495	2495
Franklin Ace 1200 OMS		1495
HP 150, 128K, 2 drives	3995	3295
IBM PC, 128K, 2 drives, green IBM monitor		2940
NEC 8201, 16K	795	589
Radio Shack:		
Color Comp, 16K, ext	199	149
Model 4, 64K, 2 dr.	1999	1495
Model 100, 24K	999	720
Timex 2068	199	139
Line Printer		
Anadex DP-9501	1725	1099
Diablo 630	2340	1689
Epson FX-80	699	519
Epson RX-80	595	269
IDS Prism 80	699	529
NEC 8023A	795	379
Okidata 82A	749	339
Okidata 92	699	425
Prowriter 8510P	695	339
Star Gemini 10X	449	255
Monitor		
Amdek 310 amber	230	159
Amdek Color I	379	289
Amdek Color II	529	410
Princeton HX-12 RGB	695	469
Quadchrome 12" RGB	795	499
Taxan 12" amber	205	122
Zenith 123 12" green	150	89
Software		
Bank Street Writer	70	45
Condor 3	650	369
dBase II	700	365
Dow Jones Mkt Analyzer	350	245
EasyWriter II	350	179
Friday	295	159
Home Accountant +	150	85
Lotus 1-2-3	495	289
Magic Window II	150	79
Multiplan	275	159
PFS:File	140	69
PFS:Graph	140	93
Perfect Writer	489	149
Screen Writer II	130	82
SuperCalc 3	395	269
TK!Solver	299	179
VisiCalc Advanced	400	275
Volkswriter	195	99
WordStar	495	225
Zork (any one)	50	26

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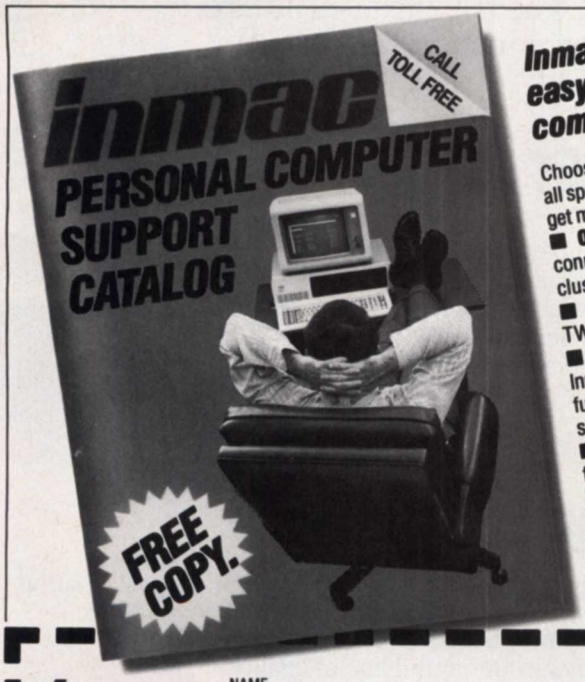

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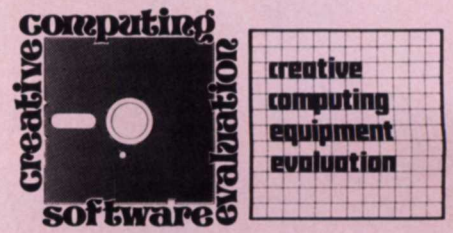
CIRCLE 204 ON READER SERVICE CARD

A Note To Our Readers



Product evaluations in *Creative Computing* are different from those in many other magazines. Here's why.

A *Creative Computing* product evaluation is objective, thorough, and in-depth. Normally, we get an actual production product for testing—on loan or purchased from the manufacturer. We do not ask for or accept any special treatment, but interact with the manufacturer as a normal customer would.

In most cases, we test the product in the environment and under the conditions in which we would expect it to be used. We do not believe that we should sit in an ivory tower and pass judgment on a product that is meant to be used by a salesman on the road or a child in a classsroom.

When we evaluate a prototype, we state that fact in the review. Even so, we do not simply recite the manufacturer specifications; instead, we use the product, apply our own tests, and report on the results. If it lives up to the published specs, fine; if not, we tell you.

In our evaluations, we call a spade a spade and a lemon a lemon. Advertisers do not receive special treatment—no one does. Some manufacturers do not like this policy and refuse to work with us or advertise in the magazine. But most manufacturers welcome our policy of scrupulous honesty, and for that, we applaud them.

Nevertheless, we are not right all of the time. Sometimes, a unit might perform well in our tests, but be a dog for you. For that, we are sorry. But for the most part, we trust you will find our reviews—and the rest of the magazine—credible, honest, and interesting. END

See jane™ run

Once there was a time,

before the written word, when people used pictures to communicate. Symbols representing entire ideas were easy to see and understand. And the people were comfortable with this language. And they were happy.

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CIRCLE 107 ON READER SERVICE CARD

7 Years Ago

The cover of the May/June 1977 issue was a disaster. Our regular printer, Banta, was on strike so we went to another one. They switched the red and blue color plates resulting in a strange-looking robot indeed.

The issue had several fascinating features including one of the first articles about Alan Kay's Dynabook (earlier issues had already discussed Smalltalk), a dream piece by Ted Nelson on the Xanadu Hypertext Project, a far-reaching projection by Arthur C. Clarke on communications, talking computers, telesafaris, and satellites, and an article by David Ahl, "Computer Power to the People," much of which is current to this day.

The issue had four tutorials, one on LSI mpu and memory chips, one on Pilot, one on writing your own CAI, and one on problem solving by working backward. All of these are still as valid as when they were written.

We had in-depth reviews of the Wave Mate Jupiter II (a wire wrapped kit), Processor Technology Sol-20, and a review/buyer's guide to sophisticated pocket calculators.

The issue had four programs complete with listings and runs including a simulation, Swarms, about the escaped South American killer bees. One piece challenged readers to produce character graphics in 20 lines or less of Basic code with no print

quotes allowed. We showed ten unbelievable graphics which conformed to these rules.

The issue had ads from all the active computer makers such as MITS, SWTPC, Cromemco, Processor Technology, Poly-Morphic, The Digital Group, Technical Design Labs, Midwest Scientific, Mini-Term, Wave Mate, Seals, Jade, Heath, Cybercom, and OSI. How many of those companies are still around today?—*DHA*

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Early Games feature multiple activities, easy to use picture menus, and colorful graphics. The games are fun, children love to play them! That's why they learn from them.

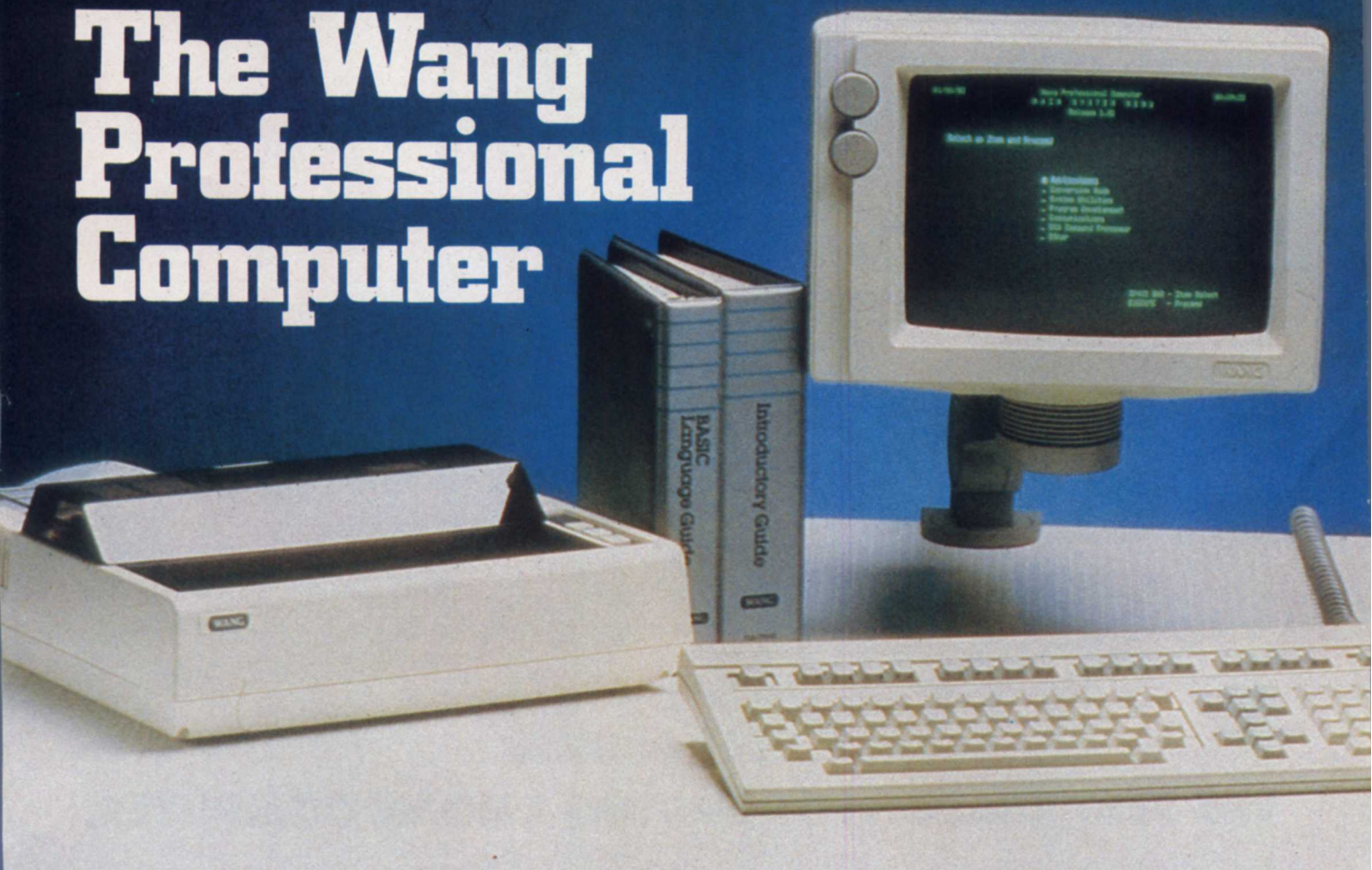
And they're the best reason for having a home computer.

CSI

counterpoint software inc.

A leader in dedicated word processing joins in the fray with a personal computer.

The Wang Professional Computer



David H. Ahl

Although new to the personal computer market, Wang is no newcomer to the computer field. In the early 1970's, the Wang 2200 was a formidable competitor to DEC, HP, and DG minis. However, it is with office automation, especially dedicated word processors, that Wang has had the most success. Even industry giant IBM has been humbled by Wang's prowess in the office automation market.

In the spring of 1983, Wang announced a personal computer dubbed the Wang Professional Computer. With its IBM-like 16-bit cpu and MS-DOS operating system, it is in the mainstream of the market. However, its menu-driven approach and outstanding word processing package elevate it into a niche of its own.

The Wang PC consists of three units: a display, detachable keyboard, and system unit housing the cpu, disk drives, and guts of the system. As with the DEC Rainbow, the system unit is designed to stand in an upright position on the floor or be suspended from a table or desktop. This feature, combined with the swivel pedestal mount for the display and detachable keyboard, means that the computer can be easily moved aside to provide workspace for other tasks.

The unit has an 8086 16-bit mpu, 128K of RAM (expandable to 640K), one floppy disk drive (a second floppy disk or Winchester drive is optional),

The Wang PC is oriented to a business user, not a computer hacker.

five expansion slots, serial and parallel ports, enhanced MS-DOS operating system, MBasic interpreter, and a wide selection of applications software.

Ergonomic Keyboard

We have the impression that detachable keyboards are getting wider and wider on each new computer. Actually,

creative computing equipment evaluation

creative computing

HARDWARE PROFILE

Name: Wang Professional Computer
Type: Small business computer
CPU: 16-bit 8086, 8 MHz
RAM: 128K (expandable to 640K)
Keyboard: Detachable, 101 keys
Display: 80 x 25 characters 800 x 300 pixels
Disk Drives: One or two 320K 5¼" floppy drives or one floppy and one 10Mb Winchester
Ports: RS-232 serial and Centronics parallel
Dimensions:
System unit: 23.1" x 14.9" x 6.5"
Keyboard: 18.3" x 7.8" x 1.7"
Display: 13.0" x 10.8" x 11.8"
Operating System: MS-DOS
Documentation: User's guide and loose leaf manuals for each software package
Summary: State-of-the-art small business computer, fastest in its class, excellent menu-driven software. Available software includes *TK!Solver, VisiOn, Multiplan, Lotus 1-2-3,* Wang Word Processing, and Peachtree packages.
Price: Base system $3265; other configurations to $7000
Manufacturer:
Wang Laboratories, Inc.
One Industrial Ave.
Lowell, MA 01851
(617) 459-5000

The keyboard is 18.3" long and has five logical groupings of keys.

at 18.3" wide, the keyboard on the Wang PC is no wider than many others, but it certainly seems to be.

The keyboard is attached to the system unit by means of a six-foot coiled cord. How far it will realistically stretch in a given installation depends upon the width of the table under which the system unit is mounted. We had a table 30" wide and found that lap use of the keyboard was possible as long as we kept fairly close to the table. Routing the cord under the table will add a foot or more.

The keyboard is a low profile unit with 101 sculpted keys arranged in five logical groupings. The alphanumeric portion is delightfully standard—no arrow or escape keys to cause unexpected glitches for touch typists. We were also pleased to find a small red LED on the caps lock key to indicate when it was depressed.

On the right side is a numeric keypad with the addition of keys for the four arithmetic operations, PRINT, ERASE, and RETURN. Between the alpha and numeric groupings is a group consisting of the four cursor movement keys, HOME, and several other special function and editing keys.

In the top row are four groupings of four control keys each, a large HELP key at the left, and a large CANCEL key at the right. This last key is frequently used to exit applications software packages and change levels on the menus. The other 16 function keys are programmable, although they carry labels describing their functions in the word processing (and some other) software packages. Plastic labels for these keys can be inserted between pinch holders just below the keys.

In addition to the caps lock LED, the keyboard has five additional LEDs for indicating trouble with various components of the system. You will notice these indicators functioning during the 30-second start-up diagnostics.

Since the invention of the manual typewriter, keyboards have been getting quieter and quieter. Wang, like several other manufacturers, apparently felt their keyboard was so quiet that aural feedback was needed to supplement the normal tactile feedback. Frankly, we are not keen on this feature, and for the likes of us, Wang has provided a routine in the operating system to modify the volume and tone of the audio keyclick.

High-Resolution Display

The normal display supplied with the Wang PC is a 12" monochrome (green) monitor. It comes with a desktop tilt-and-swivel stand. However, Wang is touting an optional $150 mounting arm that clamps to the back or side of a table or desk. Four screws fasten the monitor to this two-foot long arm. The flexible head permits a tilt range from 5° forward to 15° back. Actually, the head tilts in any direction and, after a few trains rumbled by (we are close to a railroad

The cursor keys are arranged in a logical pattern. Above them are permanent editing keys. Although they carry labels, the function keys in the top row are programmable.

track), we found our display tilting to the side like a drunken sailor.

Character resolution of the display is 25 rows of 80 characters. Each character is formed within an 8 x 10 pixel matrix. There are two pixels between adjacent characters and adjacent lines which provide excellent readability. The character set consists of the standard 96 ASCII letters, numbers, and symbols augmented by an additional 128 foreign, mathematics, and graphics characters. Character display attributes include normal, boldface, underscore (normal and boldface), subscript, and superscript in either normal or reverse video.

From the character density and interline spacing, it is not difficult to determine that the graphics resolution is 800 by 300 pixels. Graphics are handled by a bit mapping system that is independent of the text display memory thus permitting the simultaneous display of text and graphics.

All the expected graphics statements and commands are implemented in Microsoft Basic, and most programs developed for other machines should run on the Wang PC. However, since the pixel resolution of the Wang PC is 800 x 300, the proportions are slightly different from those of the IBM PC and its clones. Thus, a perfect square on the IBM PC will be a rectangle on the Wang PC and vice versa. Also, a graphics program designed for the maximum height of the IBM PC screen (350 pixels) will spill off the Wang PC screen. For the most part, we do not see this minor incompatibility as a problem, since most vendors of applications software have modified their packages for the Wang PC, but there may be certain off-the-shelf IBM PC packages or programs in books and magazines that will not run without some changes.

With the display on the optional extension arm, only the keyboard occupies desk space.

System Unit

The system unit is a sizeable component measuring 23.1" x 14.9" x 6.5" and weighing 28 pounds. Although designed for vertical placement (the Wang logo is at the top), it may also be used in a horizontal position. Although generally pictured under a table, there is no reason the unit could not rest on the table as well.

Everything plugs into the back of the system unit, and it is on the back where the power switch is found. If it is mounted under a table, this means that the power switch is practically inaccessible. We finally resorted to plugging the system into a switchable power strip to turn it on and off. In all fairness, the people at Wang tell us that this will be remedied shortly—but, hey guys, the PC has been out for a year; haven't your users been yelling about this?

The system unit houses all of the electronics and disk drives. The mpu is a 16-bit 8086 operating at 8 MHz. Moreover, all keyboard data is buffered, so the mpu is interrupted less than once every 10 ms. This leads to some excellent execution speeds compared with the other machines in its class (see Table 1).

An 8087 co-procesor for high-speed arithmetic operations is available as an option. The Wang PC is furnished with 128K of memory which can be expanded to 640K.

Standard ports include a Centronics parallel printer port and RS-232 serial port. Five expansion slots are available for additional memory and other options. These slots are unique to the Wang PC; it does not accept IBM PC boards. Some of the boards currently available include a CP/M-80 emulation card with a Z80 on board, monitor/graphics card for any RGB monitor, Winchester drive interface, and multiport communications card.

With its 8 MHz 8086 mpu, the Wang PC is the fastest computer in its class.

In contrast to some other systems, the system software sends all eight bits of every byte to the printer (many systems use only seven bits). This is to take advantage of the international character set and dot-addressable printer graphics. This works fine with most Epson and

Computer	Time	Accuracy *
Wang PC	0:08	.005859375
TI Professional	0:15	.005859375
Eagle PC-2	0:19	.005859375
IBM PC	0:24	.01159668

* *Lower is better*

Table 1. Creative Computing standard benchmark.

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Spinnaker Learning Adventure games are available for Apple,® Atari,® IBM® and Commodore 64™ home computers.

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You're in charge of an old-time railroad—and whether it turns into a bonanza or a bust depends on how well you run it. But either way you'll find that working on this railroad is a challenge—and a lot of fun! **Ages 10-Adult.**

It's New! ADVENTURE CREATOR.™

Design a challenging adventure game that you or a friend can tackle—or let the computer design one for you. It's complex, exciting—and utterly addictive! **Ages 12-Adult.**

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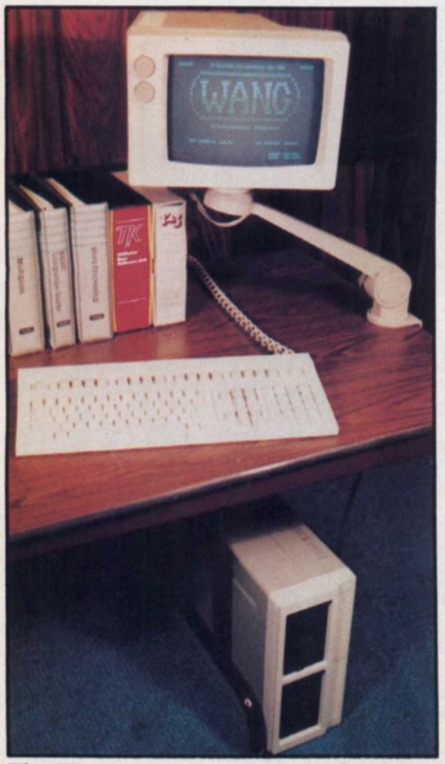


The Wang PC consists of a display (on optional arm), detachable keyboard, and system unit.

other similar printers; however, some older printers will balk at (or ignore) the eighth bit. The system has four printer drivers built in: Wang dot matrix printer, NEC Spinwriter, a general parallel printer, and a general serial printer. It is easy enough to add your own printer driver—this was one of the first things we did—but there may be certain special features like a double underscore that will not work correctly.

The basic system comes with one double-sided, double-density 5¼" floppy disk drive with a capacity of 320K. A second floppy disk drive can be added or a 10Mb Winchester drive installed in the second opening. Our system was equipped with the Winchester drive. We have had some unfortunate experiences with Winchester drives on other systems—one got out of whack from being moved and another forgot everything it knew when we mistakenly tried to format it as a floppy disk. However, after a jouncing ride in a car from Lowell, MA to Morris Plains, this one worked fine. Moreover, the operating system is smart enough to not allow you to reformat it. Bottom line: it worked flawlessly.

Upon powering up, the system goes through a 30-second diagnostic self-check. Frankly, waiting for this gets old fast. In addition, a systems software diagnostic disk is furnished with the system.

MS-DOS Operating System

As should be well-known to the readers of *Creative Computing*, Microsoft's MS-DOS operating system is virtually identical to PC-DOS for the IBM PC (which Microsoft also wrote). In the 16-bit arena, MS-DOS has an enormous lead over CP/M-86, and it is well on its way to becoming the worldwide standard.

However, as is wont to happen to standards in the computer industry, manufacturers apply their own customizing in an effort to gain competitive advantage or make better use of their hardware features. In keeping with this tradition, Wang has added some nifty features to MS-DOS, principally one which disguises it completely as a menu-driven operating system.

Frankly, one of the least user-friendly aspects of using a computer is interacting with the operating system. Wang has improved this function considerably with what they call System Screens. Each screen has a label at the top identifying the screen, software release version, date, and time. In the center is a list of items that may be selected. The space bar moves the cursor from item to item; the EXECUTE key selects an item; and CANCEL goes to the previous menu. In addition, the HELP key furnishes additional information about the items on the screen.

MS-DOS is improved considerably with the addition of System Screens or menus.

In addition to being easy to use, it is also very easy to add items to the System Screens. It took us just a few minutes to add an additional menu item, "Benchmark Test," complete with a more elaborate explanation which appears when the HELP key is pressed.

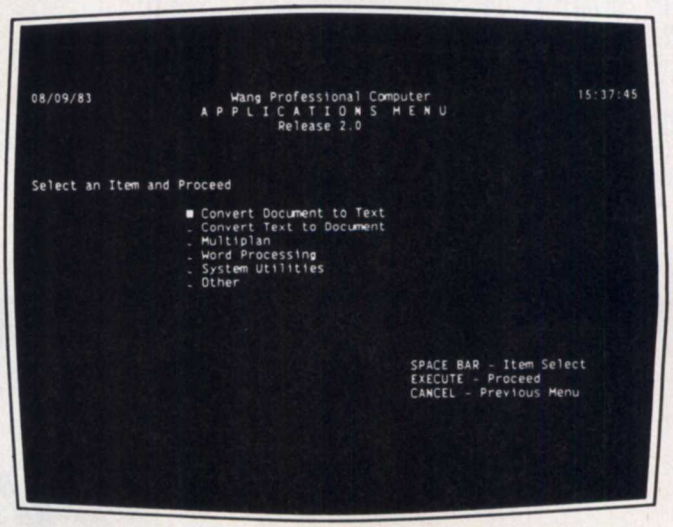
For diehard users who want to subject themselves to the fun and frustration of MS-DOS itself, that option is available. Actually, for certain things it might be faster to go directly to a program from MS-DOS instead of wading through two or three menu screens. The nice thing is that Wang has left this choice up to the user: menus or MS-DOS, whichever is most comfortable.

Word Processing

Most small business computers that come with bundled software include one of the well-known word processing packages such as *WordStar* or *Perfect Writer*. In our reviews, we generally note how well the included package is integrated with the hardware features of the computer. However, Wang PC offers its own WP package, so our review of it is somewhat longer than usual.

As we mentioned at the outset, Wang is a major producer of dedicated word processing systems, so it was only natural that they would choose to implement Wang Word Processing on the Wang PC. Right up front, let us say that this is a most impressive system. Even after spending several weeks with the computer, we are sure that there are many features that we did not discover. But here is what we did find out.

The system is menu-driven with a hierarchy of menus and numerous special function keys. The first menu offers the following choices: Edit Old Document, Create New Document, Print Document, Document Index, Utilities, and five other functions. Pressing the spacebar highlights menu items in turn while the EXECUTE key selects the desired one.



Easy-to-use Systems screens (like this one) replace the usual MS-DOS commands.

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CIRCLE 168 ON READER SERVICE CARD

Entering the edit mode brings up a screen with a status line on top. This shows the document name, page, line, and cursor position. The second line is a format line which shows line spacing and the position of tab stops and margins, rather like an old manual typewriter. A message line at the bottom left displays error messages and system information.

Normally, when entering text, you are in an overstrike mode. To delete a character (or portion of text), you move the cursor to the start of the text to be deleted, press DELETE, move the cursor to the end of the portion to be deleted, and press EXEC. To insert text, you move the cursor to the point at which you wish to insert something, press INSERT, and everything after the cursor disappears with the exception of 29 characters following the cursor which reappear at the bottom of the screen. When you have finished inserting, you press EXEC, and all the text reappears in the new format. If you are used to a word processing system which inserts characters by pushing the whole screen of text around, the Wang approach will seem mighty strange, but it works well, and we got used to it in short order.

An interesting feature is the use of low-intensity dots to show each hard (deliberate) space. Other spaces, such as those created at the end of lines as words wrap around, are completely blank. We found this feature very helpful as it removed all ambiguity as to how a document would appear when it was printed.

As mentioned, the cursor keys move the cursor a character or a line at a time around the document. Curiously, there is no way to jump in slightly larger increments, in particular, a word or a paragraph at a time. The GOTO key in conjunction with the cursor keys moves the cursor a page or a line at a time. To move to other pages, you can use NEXT, PREV, or GOTO a particular page number.

The PAGE key is used to instruct the system where a page break will occur when the document is printed. A page can contain a maximum of 126 lines or 4000 characters, far in excess of what fits on a typed page; this is useful for printing charts on continuous form paper. Inserting page breaks is not just a nice, extra feature; you must use it since the printing routines will not automatically create pages in the final printed document. The latest version of the word processing software allows repagination of a document manually or automatically.

In the word processing package, low-intensity dots are used to show each hard space.

The latest version also has the ability to print headers and footers (including page numbers). It also has several "advanced" printing functions such as printing text directly from the screen, print spooling, merging two documents in the printing process, and a "typewriter" mode which lets the system act as an electronic typewriter.

The format keys are used to establish a layout that is specific to the requirements of each document. In addition to the primary format line (tab stops, etc.), a document can have a secondary format line (for tables or charts). These are quite easy to create, change, and call up.

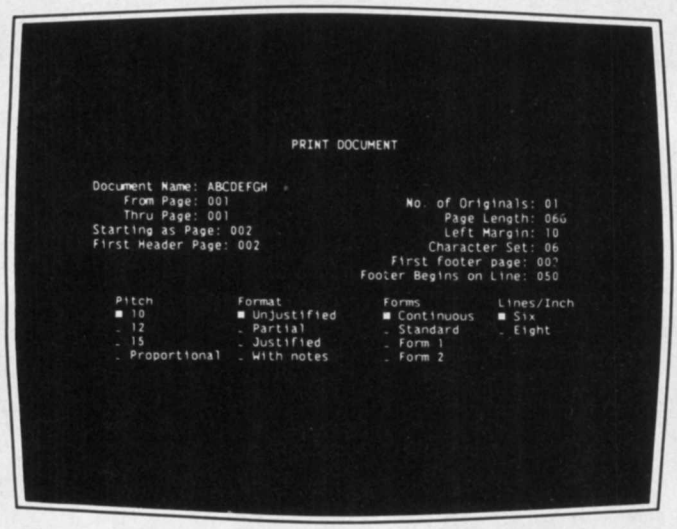
In addition to the format line, there are several specific formatting function keys including DEC TAB (aligns decimal points in a column), INDENT (temporarily change left margin), and CENTER (centers a character string). A subscript/superscript key raises and lowers text by half a line. There are also keys to create boldface and a single or double underscore. These attributes can be applied "manually" a character at a time or can be toggled on and off.

The system has a search and replace feature which can search for up to a 32-character string and selectively or globally replace it. There is no wildcard search capability. Blocks of text can be moved or copied within a document or from one document to another.

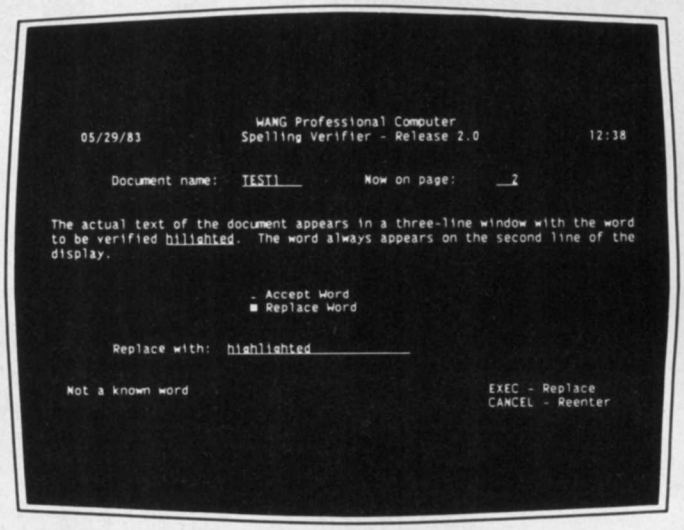
Documents are printed through the print menu. The primary menu allows the selection of the document name, start and end page for printing, page length, margins, pitch, justification, lines per inch, and type of form. If you have a printer that is able to respond to the embedded control codes, all the character attributes (bold, underscore, etc.) will be reproduced in the hard copy.

Glossary is a feature that lets you store commonly used text such as addresses, standard paragraphs, and forms in special documents called Glossary Documents. Such documents can be recalled and entered into another document with just two keystrokes. This is an exceptionally handy feature, and, with a Winchester disk, you hardly notice the time to retrieve the document and insert it.

The system has a spelling verifier utility which locates misspelled words and allows you manually or automatically to replace them with the correct spellings.



The word processing package makes extensive use of menus (like this one).



Sample screen from Spelling Verifier program.

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CIRCLE 164 ON READER SERVICE CARD

The spelling verifier includes a 30,000-word master dictionary. In addition, it has a dictionary builder that allows you to add words of your own.

The most recent WP release has two unexpected utilities, Math and Sort. The Math utility allows you to add, subtract, multiply, divide, and calculate percentages within a word processing document. This is almost a mini-spreadsheet capability.

The Sort utility automatically arranges lists of information such as names, addresses, and numbers, in either alphabetical or numerical order.

Wang PC Basic = MBasic

Although the documentation refers to Wang Interpretive Basic V1.20, it is really Microsoft GW (Gee Whiz) Basic that is implemented on the Wang PC. This is the most advanced version with all the bells and whistles including all of the advanced data file input and output commands, extended functions, and debugging features.

In addition, this implementation has the full range of graphics commands including COLOR, PALETTE, and PAINT. It also has sound capabilities including BEEP, SOUND, and PLAY, although the internal 2" speaker hardly does justice to the sound generation hardware.

Applications Software

There are three types of software for the Wang PC: that which is sold and supported by Wang directly, that which is distributed (but not supported) by Wang, and third party software. A most impressive range of applications software is available for the Wang PC when one totals the offerings in all three categories.

For example, in the second category, we tried *Lotus 1-2-3, TK!Solver* from Software Arts, and Microsoft *Multiplan.* All three packages are customized to take advantage of the function keys on the Wang PC, and all three come with a function key overlay and quick reference card or booklet. (We weren't too impressed with the plastic function key overlay of *Lotus 1-2-3* as it did not fit quite right, but frankly, that is a very small nit against the excellent operation and capabilities of the package.)

As mentioned, these packages fall into the category of "Wang Distributed Software" and are applications evaluated and distributed by Wang. Also in this series are *Advanced VisiCalc, VisiOn,* and the Peachtree accounting packages including job costing, accounts receivable and payable, payroll, general ledger, inventory control, and calendar management.

Basic and Wang Word Processing are in the first category (sold and supported). Other packages in this group include MicroFocus Level II Cobol; Wang Office, an integrated package providing time, task, communication, and information management; PC Business Graphics to produce line, bar, and pie charts; and PC Data Base, a versatile, relational database package.

Other optional languages include a Basic compiler, Pascal, Fortran, and a compatible version of Wang 2200 Basic.

In the area of data communications, Wang has an especially rich offering with a hardware/software local interconnect option and packages which emulate the IBM 3276 (sync or bisync) and 3270. These packages permit the Wang PC to interact with a wide variety of IBM mainframes without any programming changes. A 3278 emulation board allows the Wang PC to replace a 3278 terminal while maintaining the ability to operate concurrently and independently of host programs. A program to emulate the DEC VT-100 is also available.

Our praise goes to the folks at Wang for putting together an integrated Basic reference guide.

Voice Attachment

The Voice Attachment is a hardware/software option combining a smart modem, automatic answering device, and conference speaker phone all in one compact unit. It can dial, control and monitor both voice and data calls, automatically answer incoming calls, function as a 300-baud modem, and operate as a telephone amplifier.

A related software package is PC Notebook, a package for the storage and retrieval of unstructured text. It functions with the Voice Attachment by searching for and dialing phone numbers automatically. The key feature of PC Notebook is its sophisticated query and selection capabilities through which it can access any entry in the notebook from just a single word or string.

Documentation

In a word, the documentation with the Wang PC is outstanding. Unlike so many other computers that furnish a meager introductory guide and applications software manuals written by the software vendors, everything for the Wang PC seems to be fully customized and printed especially for it.

The Introductory Guide is a fat 500-page manual that covers unpacking, connecting, system screens (menus), the editor, and a great deal in between. Illustrations of the hardware components, keyboard, and screen are included wherever appropriate. In addition, the manual includes a customized glossary and an index, a rarity in a manual of this type.

Our praise goes to the folks at Wang for putting together an integrated Basic reference guide and finally abandoning the inadequate documentation that Microsoft has been supplying to the manufacturers. Why some manufacturer didn't redo the Microsoft guide long before this is beyond us, but perhaps this will set a precedent.

The Word Processing Guide is curious. It is divided into two sections: a Training Guide and a Reference Guide. However, the material is practically identical, just presented in a different order. We found the Training Guide quite easy to use and more efficient than the Reference Guide, although perhaps we would lean toward the Reference Guide after becoming more familiar with the system.

The manuals with the applications packages are all customized for the Wang PC. This contrasts with the approach of many other manufacturers of furnishing the manual from the software vendor with a few sheets showing how it is adapted to the particular computer.

All the manuals are in three-ring looseleaf binders, thus making updates neat and easy to insert. The Introductory Guide, for example, came with approximately 100 sheets to replace and augment those of the manual.

Pricing

Wang offers four partially bundled configurations of the Wang PC at prices below those of the individual components. The components are also available unbundled.

The PC001 base system consists of the system unit with 128K, single floppy disk drive, keyboard, MS-DOS, and Basic interpreter. Price is $2595.

The PC002 adds the character display adapter and monochrome monitor and costs $3265. The PC003B adds (to the PC002) a second floppy disk drive and costs $3790. The PC004A adds (to the PC002) a graphics display adapter and second disk drive. Price is $4030.

The PC005 adds (to the PC002) the graphics adapter and 10Mb Winchester drive; it costs $6400.

A bundled software package consisting of Wang Word Processing, *Multiplan,* and asynchronous communications costs $650.

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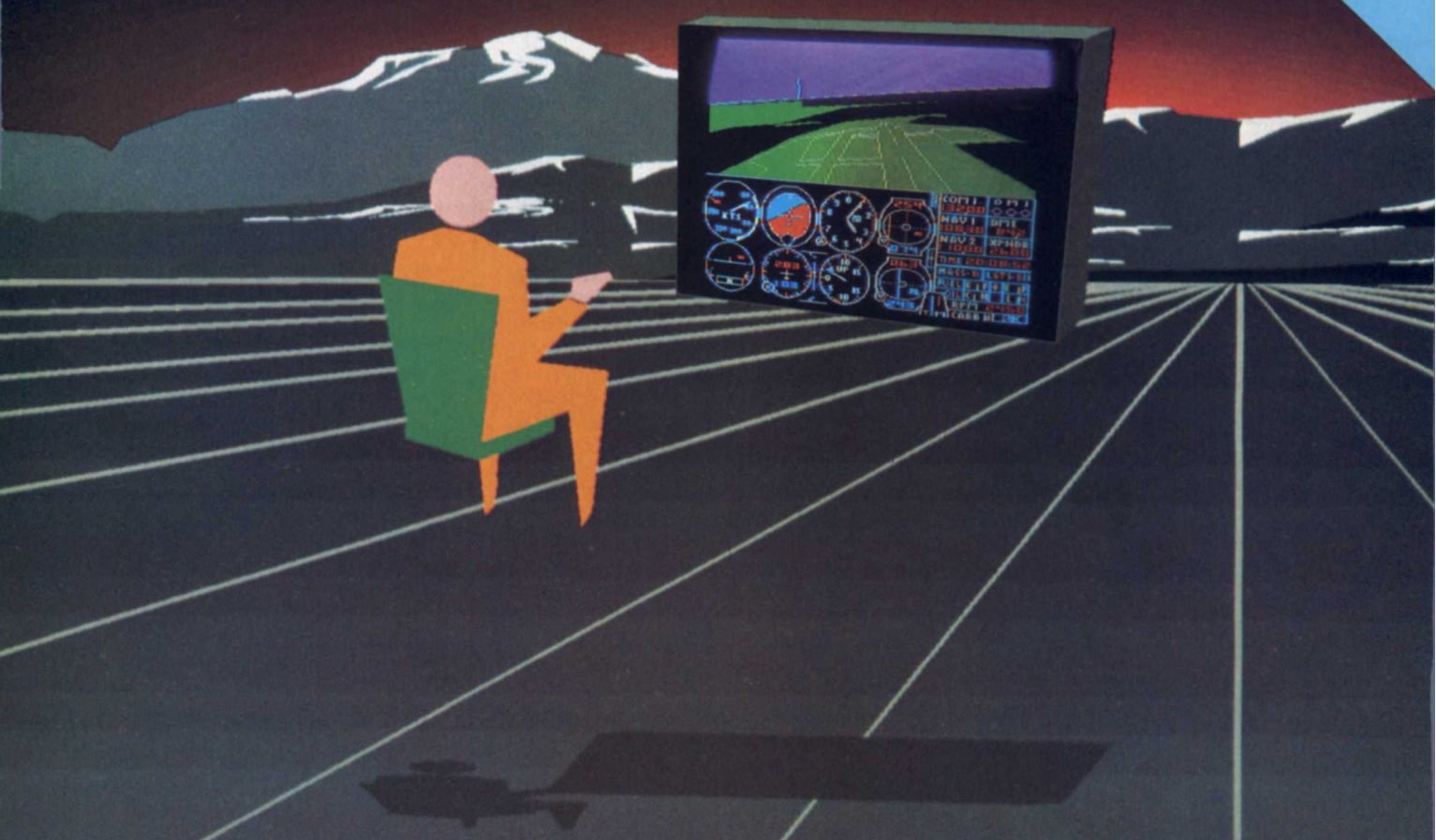

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Wang Computer, continued...

Add-on memory boards cost $500 for 128K, $850 for 256K, and $1700 for 512K. The 10Mb Winchester drive is priced at $2385.

From this, it should be evident that Wang is not trying to gain a place in the market by using price as its primary weapon. Complete configurations cost just slightly less than comparable versions of the IBM PC; thus customers must make a purchasing decision based on hardware and software features.

Choosing A System

The Wang PC is in the mainstream of modern small business computers with its 16-bit 8086 mpu, MS-DOS, and wide selection of applications software. Its easy-to-use menu screens and word processing package, based on the dedicated Wang WP system, are oriented to a business user, not a computer hacker.

The other applications software is excellent and includes packages that ought to answer the needs of the majority of business users. For users who want to do their own program development, the availability of both interpreted and compiled Basic, Pascal, Cobol, and Fortran should be more than ample.

For users who wish to communicate with other personal computers, a distant database, or a mainframe, Wang offers a wide selection of options including software that emulates the most widely-used terminals.

We were very impressed with the speed of the Wang PC, it being two to three times as fast as most of its competitors. This speed is a real benefit when reformatting word processing text screens, recalculating large spreadsheets, and performing recursive calculations in *TK!Solver.*

One fault we found was in the sparsity of information about the use of color graphics. Presumably, the capability exists as it is mentioned in the Business Graphics brochure, but it was not at all clear what was necessary to take advantage of this feature.

Another minor problem was in setting up a printer driver to take advantage of the features of the computer and vice versa. We would have liked to see drivers for more printers on the operating system disk.

As might be expected, no games or educational software exists or are planned for the Wang PC; the machine is aimed squarely and exclusively at the business user.

Despite these minor shortcomings, we would have no hesitation in recommending the Wang PC to anyone who wants a state-of-the-art personal computer for business applications. END

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creative computing equipment evaluation

A Low Cost Desktop System

The Morrow Micro Decision

With the MDT20 optional terminal resting above the computer enclosure, the Micro Decision bears a striking resemblance to IBM's PC. But at two-thirds the price it is a little easier on your pocketbook.

Laurie Baggiani

Unlike skyrocketing food prices, prices in the computer marketplace continue to fall. It's not so surprising, therefore, that George Morrow, founder of Morrow Designs, Inc. has adopted the phrase "more for less" in advertising his newest line of desktop computers named the Micro Decision.

There is no doubt the phrase aptly describes the Micro Decision, which is a powerful CP/M-type computer based on a single printed circuit board design. The basic two-drive system (MD2, as it is called) includes an 8-bit, Z80 main processor with 64K of memory, two serial ports, one parallel port, a green phosphor terminal, seven bundled software packages, and two 5¼" double density, floppy disk drives (storing 200K each)—all at a retail price of $1599.

creative computing

HARDWARE PROFILE

Name: Micro Decision

Type: Desktop

CPU: Z80A (4 MHz)

RAM: 64K

ROM: 2K

Type of keyboard: 8 cursor control keys, 7 programmable function keys, detachable, 92 keys, 14-key numeric keypad

Text resolution: 80 x 24

Graphics resolution: 9 x 12 dot matrix

Number of colors: Green phosphorous

Sound capability: None

Ports: 2 RS-232C serial ports, 1 parallel port

Dimensions: 5.3" x 16.7" x 11.3"

Documentation: Good user manual, pilot very good

Summary: A reliable CP/M computer. Good for novice and expert alike.

Price: $1599

Manufacturer:
Morrow Designs
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San Leandro, CA 94577
(415) 430-1970

One feature especially welcomed by neophytes is Morrow's Micro Menu, a menu driven front end to CP/M 2.2.

These features alone, however, don't make the Micro Decision unique. After all, low-cost systems with bundled software have been on the market for a while, most notably in the humbled Osborne 1 and its close rival, the Kaypro II. What *does* make the Micro Decision special is being the first *desktop* offering in this class, along with several distinctive features designed to make CP/M-style computing less threatening to the computer novice.

One feature especially welcomed by neophytes is Morrow's Micro Menu, a menu driven front end to CP/M 2.2, which provides a gradual introduction to the popular and somewhat legendary

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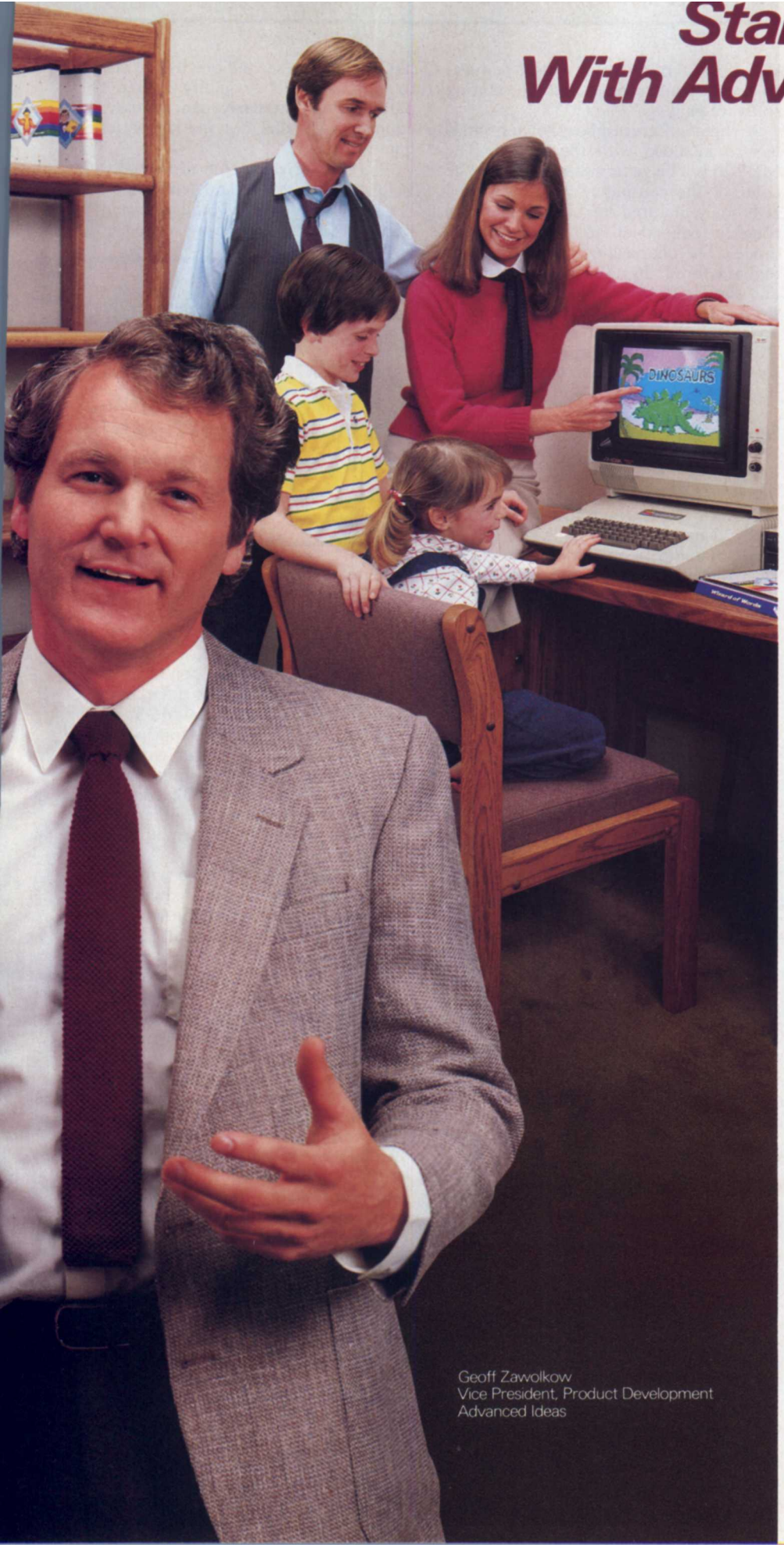

Geoff Zawolkow
Vice President, Product Development
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How to Choose Software for Your Home

"As an educator with over a decade of experience using computers with children, I've found there are key features in a well-designed learning game. One is *extendability.*

Look for enough variety to hold your child's attention over time. Some games are appealing in the short run, but are quickly mastered. Supplementary materials such as disks of added lessons can continue your child's interest and enjoyment.

The ability to modify a program is another form of extendability. Authoring systems can let you create lessons on your own topic areas for any age level and allow children to create and save original work, giving a sense of completion and pride vital to learning."

Software of Choice

Advanced Ideas (formerly Computer-Advanced Ideas) leads the industry with programs designed for extendability through easy-to-use authoring systems and a unique library of LearningWare™ diskettes. Rich game play and sound educational design have won Advanced Ideas programs the approval of the National Education Association.

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CIRCLE 103 ON READER SERVICE CARD

operating system. Described as "your road map through CP/M," the menu lets you access six of the applications programs provided with the unit, or select a utility menu for help in performing nine of the most common CP/M utilities.

Clear, concise, on-screen directions, make commands like formatting a disk, copying and renaming files, as easy as following a recipe—regardless of your level of computer expertise. Conveniently, too; once you become adept at working within CP/M, the menus can be deactivated, restoring the standard CP/M level of operation.

Another nice feature for beginners is the on-line tutorial which can be accessed via the Micro Menu or directly from the CP/M prompt. The CP/M tutorial provides explanations of all of the fundamental system commands such as ERA, REN, DIR, STAT, and SYSGEN, along with brief illustrations of the conventions required to use them.

I grant you, this is not a fancy 16-bit machine. Nor is it time-sharing, multi-user, or dual-processing, with inexpensive I/O expansion. But as an entry level, CP/M-based computer, it has a rather impressive array of hardware and software to offer, for the money.

Aside from user-friendly enhancements to the operating system, the computer comes with seven software packages, covering the full range of most initial software requirements. They include: *WordStar,* the popular word processing program; *Correct-It,* a spelling checker and corrector; *LogiCalc,* an electronic spreadsheet program; *Personal Pearl,* a database manager; and Morrow Designs' Pilot, BaZic, and Microsoft's Basic 80, three very different programming languages.

The MD3 version, which costs $1899 and provides 768K of disk storage in two half-height 5¼" doublesided, double density disk drives, also features *Quest,* a bookkeeping and accounting software package.

A choice of green phosphor terminals is also included with the system. The MDT20 is a beige terminal matching the color of the computer/drive enclosure. It is manufactured by Lear Siegler and roughly equivalent to their ADM20 model. The charcoal-colored MDT50 is manufactured by Liberty Electronics and similar to their Freedom 50 model. Both terminals retail for approximately $595; however, if you already own an RS-232 terminal you can buy a Micro Decision without the terminal for that much less.

System Hardware

Honoring trends toward smaller, lighter equipment, the computer and drives are efficiently housed in a single enclosure measuring 16.7" wide, by 11.3" deep, by 5.3" high. The case is made of radio frequency inhibiting fabricated sheet metal, minimizing interference with television sets and the like. The plastic front panel is a matching shade of beige and, depending on the drive configuration, the unit weighs between 14 and 18 lbs.

The single board computer resting at the base of the chassis is at the heart of this diminutive machine. It contains: a Z80A type central processing unit operating at 4 MHz, 64K of dynamic memory, 2K of EPROM, two RS-232C serial ports, one parallel port, and a floppy disk controller. A small switching power supply is located at the right of the chassis, in the rear. And although it is ventilated by convection-cooling the unit generates very little heat, even with extended use.

The I/O ports access the rear of the unit with plastic connectors mounted at right-angles to the circuit board. One serial port is used to interface to the terminal, leaving the second one free to attach to a modem or letter quality printer. The parallel port, similarly can be used to connect a parallel dot matrix or letter quality printer.

The disk drives which are two-thirds height on the MD2 and half-height on the MD3 further the overall efficiency of design. Unlike many floppy systems, the disk drive heads are in contact with the disk surface whenever the drive door lever is closed. This does not, however, seem to affect adversely wear on the disks.

The MDT20 has a setup key which allows configuring many of the video attributes, simply by keyboard entry—a convenience lacking in the MDT50.

From an external point of view, though, there are slight differences between the MD2 and the MD3, during disk operations. Aside from a reeling "whir" sound during read/write operations and a slight motor sound when the drives cycle on, the MD2 runs rather quietly. The MD3, on the other hand, is a bit noisier and more distracting during disk operations.

Both terminals provided with the Micro Design offer blink, reduce, reverse video, and underline attributes on a standard size (12" diagonal) non-glare screen. Accommodating 80 characters per line, 24 lines per screen, with a 25th status line, the full 128 character ASCII set is displayed on a green phosphor, dot matrix field. Information can be transmitted in conversation or block mode, at rates up to 19,200 baud, although the Micro Decision itself is limited to a maximum baud rate of 9600. The terminals also feature an auxiliary RS-232 serial output port, supporting X-ON/X-OFF (Busy/Ready Handshake) protocol, which will operate at a different baud rate than the main port to the computer.

With all this in common, you might be wondering what is different about these terminals, aside from their color. To be brief about it, three things. First, the screen resolution is finer on the MDT50. Letters are crisper, thinner, and clearer with character serifs. Second, the keyboard is in some ways superior on the MDT50, since the control key is positioned higher (where you

The detachable keyboard on the MDT20 comes with 92 keys, including: a setup key, seven programmable function keys, eight cursor control keys, four editing keys, and a fourteen-key numeric keypad.

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Introducing Macintosh. What makes it tick. And talk.

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The garden variety 16-bit 8088 microprocessor.

Macintosh's 32-bit MC68000 microprocessor.

Some hard facts may be in order at this point:

Macintosh's brain is the same blindingly-fast 32-bit microprocessor we gave our other brainchild, the Lisa™ Personal Computer. Far more powerful than the 16-bit 8088 found in current generation computers.

Its heart is the same Lisa Technology of windows, pull-down menus, mouse commands and icons. All of which make that 32-bit power far more useful by making the Macintosh™ Personal Computer far easier to use than current generation computers. In fact, if you can point without hurting yourself, you can use it.

Now for some small talk.

Thanks to its size, if you can't bring the problem to a Macintosh, you can always bring a Macintosh to the problem. (It weighs 9 pounds less than the most popular "portable.")

Another miracle of miniaturization is Macintosh's built-in 3½" drive. Its disks store 400K—more than conventional 5¼" floppies. So while they're big enough to hold a desk full of work, they're small enough to fit in a shirt pocket. And, they're totally encased in a rigid plastic so they're totally protected.

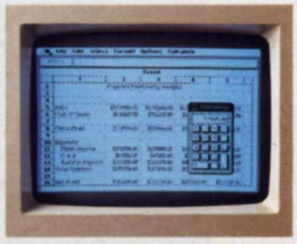
And talk about programming.

There are already plenty of programs to keep a Macintosh busy. Like MacPaint,™

a program that, for the first time, lets a personal computer produce virtually any image the human hand can create. There's more software on the way from developers like Microsoft,® Lotus,™ and Software Publishing Corp., to mention a few.

Macintosh automatically makes room for your illustrations in the text.

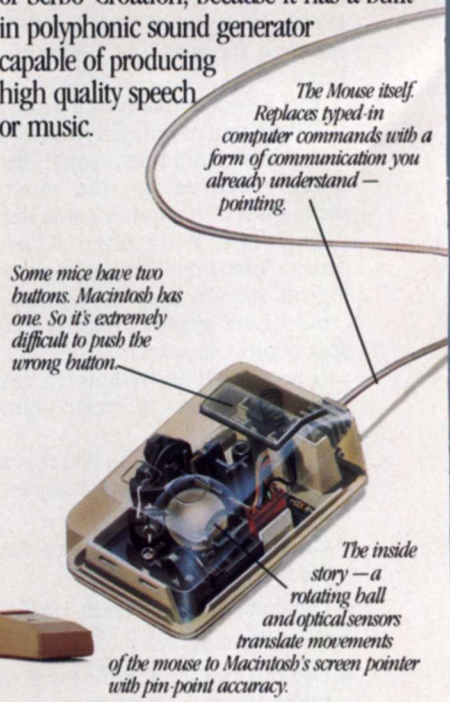
MacPaint produces virtually any image the human hand can create.



Microsoft's Multiplan for Macintosh.

And with Macintosh BASIC, Macintosh Pascal and our Macintosh Toolbox for writing your own mouse-driven programs, you, too, could make big bucks in your spare time.

You can even program Macintosh to talk in other languages, like Yiddish or Serbo-Croation, because it has a built-in polyphonic sound generator capable of producing high quality speech or music.



The Mouse itself. Replaces typed-in computer commands with a form of communication you already understand — pointing.

Some mice have two buttons. Macintosh has one. So it's extremely difficult to push the wrong button.

The inside story — a rotating ball and optical sensors translate movements of the mouse to Macintosh's screen pointer with pin-point accuracy.

All the right connections.

On the back of the machine, you'll find built-in RS232 and RS422 AppleBus serial communication ports. Which means you can connect printers, modems and other peripherals without adding $150 cards. It also means that Macintosh is ready to hook in to a local area network. (With AppleBus, you will be able to interconnect up to 16 different Apple computers and peripherals.)

Should you wish to double Macintosh's storage with an external disk

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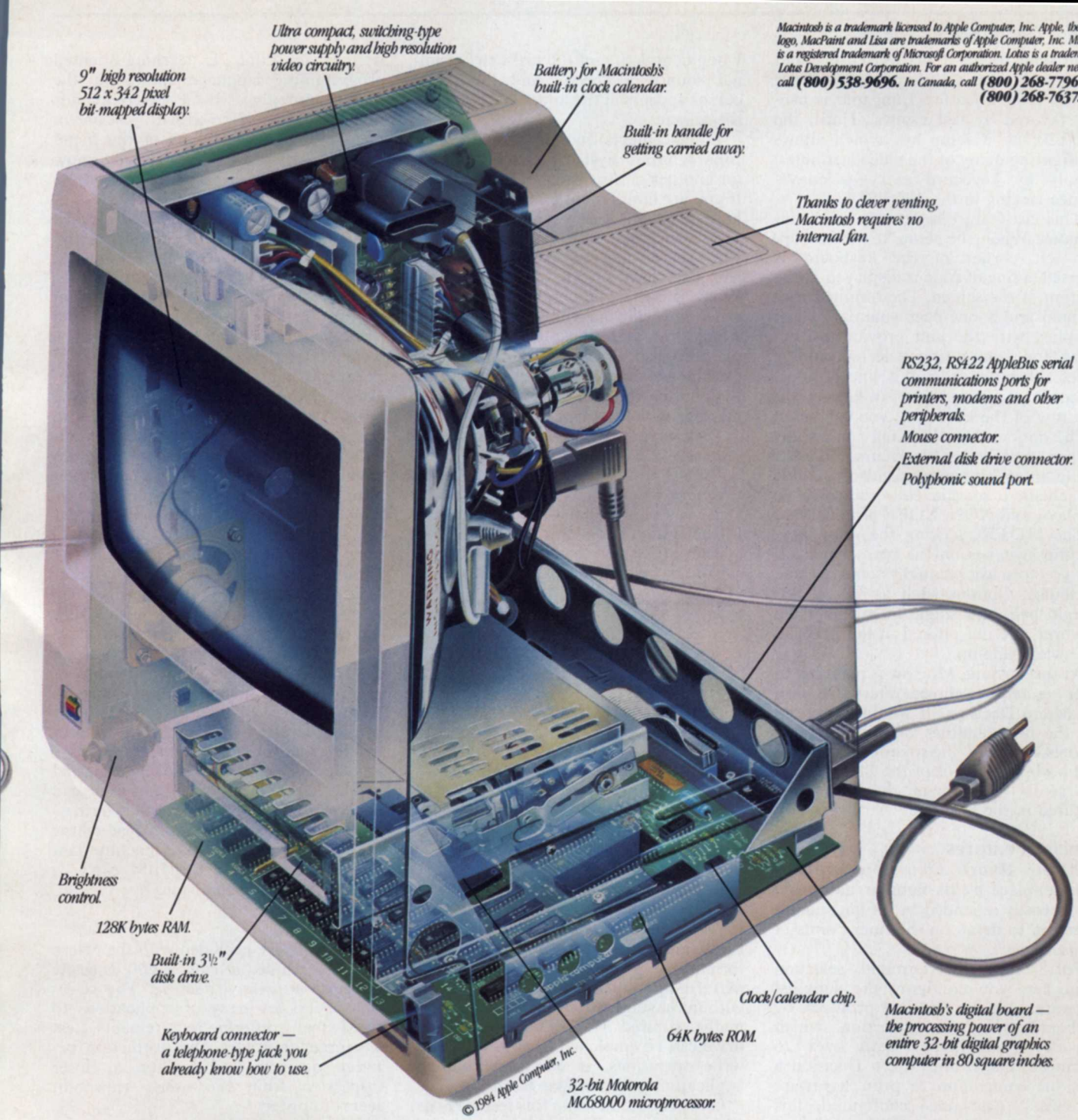

drive, you can do so without paying for a disk controller card—that connector's built-in, too.

There's also a built-in connector for Macintosh's mouse, a feature that costs up to $300 on computers that can't even run mouse-controlled software.

One last pointer.

Now that you've seen some of the logic, the technology, the engineering genius and the software wizardry that separates Macintosh from conventional computers, we'd like to point you in the direction of your nearest authorized Apple dealer.

Over 1500 of them are eagerly waiting to put a mouse in your hand. As one point-and-click makes perfectly clear, the real genius of Macintosh isn't its 32-bit Lisa Technology, or its 3½" floppy disks, or its serial ports, or its software, or its polyphonic sound generator.

The real genius is that you don't have to be a genius to use a Macintosh.

You just have to be smart enough to buy one.

Soon there'll be just two kinds of people. Those who use computers. And those who use Apples.

don't tend to hit it inadvertently), and the keys present a little more resistance as you type; a feature I am told is usually favored by fast typists. Third, the MDT20 has a setup key which allows configuring many of the video attributes, simply by keyboard entry—a convenience lacking in the MDT50.

This last feature is actually rather ingenious. When the setup key in the upper left corner of the keyboard is pressed, a line of code is displayed at the bottom of the screen. The terminal user manual and a one-page summary sheet supplied with the unit provide instructions for configuring selected audio/video attributes from this line of code. Accordingly, using the arrow keys on the top row of the keyboard, you can select such options as: blinking or steady cursor, underline or block cursor, dual or single intensity, inverse video, audible key clicks, a margin bell, control code displays, and XON/XOFF protocol.

The MDT50, lacking the setup key, has dip switches on the rear, which allow you to select manually some of these attributes. Options such as key clicks, margin bell, and single intensity mode, however, are not offered in the MDT50 dip switch line-up.

At this writing, Morrow is planning to offer yet another choice of terminal with the Micro Decision. It would be nice to see the best qualities of both of these models—namely, the superior resolution and keyboard layout of the MDT50 and the setup function of the MDT20—featured in the new one.

Special Features

If the Micro Decision appears commonplace by its familiar hardware, this is easily amended by an uncommon attention to detail on the finer points of its use.

For starters, a terminal selection menu lets you configure the supplied software with the terminal protocol, by keyboard entry. The selection, which provides compatibility with over 26 terminals, makes the Micro Decision a versatile companion to prior hardware purchases. And once configured, this selection remains in effect until you change terminals.

Automatic diagnostic tests account for a second class of features exemplifying an attention to detail. Once the power switch on the computer is turned on, the system automatically performs memory tests. Since the tests are located in EPROM, they execute whether or not a disk is in the drive.

The terminal also performs automatic diagnostics on reset or power on; checking the integrity of the display memory, program memory, non-volatile memory and the associated internal control logic. Upon completion of the tests, the terminal sounds a "beep" and the green cursor appears in the upper left corner of the screen.

Enhancements in the BIOS (Basic Input/Output System) are responsible for another group of distinctive features. If you are familiar with CP/M, then you have probably seen cryptic error messages, such as BDOS ERR ON B:, which take what may be a simple problem and turn it into detective work. What is special about the Micro Decision is a built-in error detection system which translates these statements into plain English. For instance, if you try to execute a command without first closing the door on the disk drive, the following message will appear on the screen:

> Disk error on drive A: Drive not ready.
> Type R to try again, A to Abort, I to Ignore.

Once you close the drive door and type R, the system boots normally.

The BIOS also has a *Virtual Drive* capability, which allows one drive to serve as an extra, providing you with *virtually* another drive. This ability can be advantageous in reading a directory, formatting a disk, copying files, or performing numerous other CP/M tasks without having to use the control-C normally required by CP/M. The virtual drive can be employed in both read and write operations, as well as within an application program like *WordStar.*

The auto program allows you to program a turnkey disk which automatically executes a particular program when the system is booted.

One pleasure in using this feature is its utter simplicity. To invoke the virtual drive, you simply substitute an imaginary drive reference for the physical drive reference normally used in a CP/M command. For instance, if all your drives are in use and you want to locate a file on another disk, you simply type DIR C: (the C representing your imaginary drive) and press RETURN. The system then assigns drive A to drive C, asking you to exchange disks, and displays the directory.

As stated earlier, the CP/M 2.2 operating system is enhanced with Morrow's Micro Menus. The menus are written in Pilot, a learning-oriented programming language and allow the most commonly used CP/M commands to be quickly performed with just one or two keystrokes. A bonus of the menu system is that if you don't already know CP/M, you soon learn it and become comfortable with it.

Like training wheels on a bicycle, though, there will come a time when you will no longer need or want the menus. At this point you can either exit to CP/M using the escape option within the menu itself or deactivate the menu *permanently* by erasing all programs with a pilot extension (.pil).

Several supplementary utility programs also provide useful computing tools. The auto program allows you to program a turnkey disk which automatically executes a particular program when the system is booted. A setup program also enables you to select conveniently the baud rate and protocol for the serial port and assign limited I/O byte functions to either the serial or parallel ports.

Disk compatibility programs also help to eliminate some of the problems with the current nonstandardization in minifloppy formats. Using these programs, the system can read, write, and run programs created on or for the Osborne 1 and Xerox 820 computers. This is achieved either by redefining a drive to emulate the foreign format or by copying the foreign disk to a disk formatted by the Micro Decision. It can also read and write to CP/M-86 data files formatted for an IBM PC, but because of the different microprocessors, machine language programs for the IBM can't be run on the Micro Decision.

Software

The software provided with the Micro Decision, valued at over $1500, is easily its most impressive feature. The selection covers an array of applications to satisfy many differing requirements. Lest we forget, however, the distinction between quantity and quality, a closer inspection from the user's viewpoint seems in order.

WordStar, the word processing program by MicroPro gets a gold star in my book as the prima donna in the software queue. *WordStar* is a very capable program—capable of far more, in fact, than I will probably ever use it for. At the same time, it is not *that* difficult to learn; requiring only a two or three-day effort to master the most essential commands.

With the exception of concurrent printing and editing operations, *WordStar* also performs quite well on the Micro Decision, with fast overlays and rapid execution of commands. You

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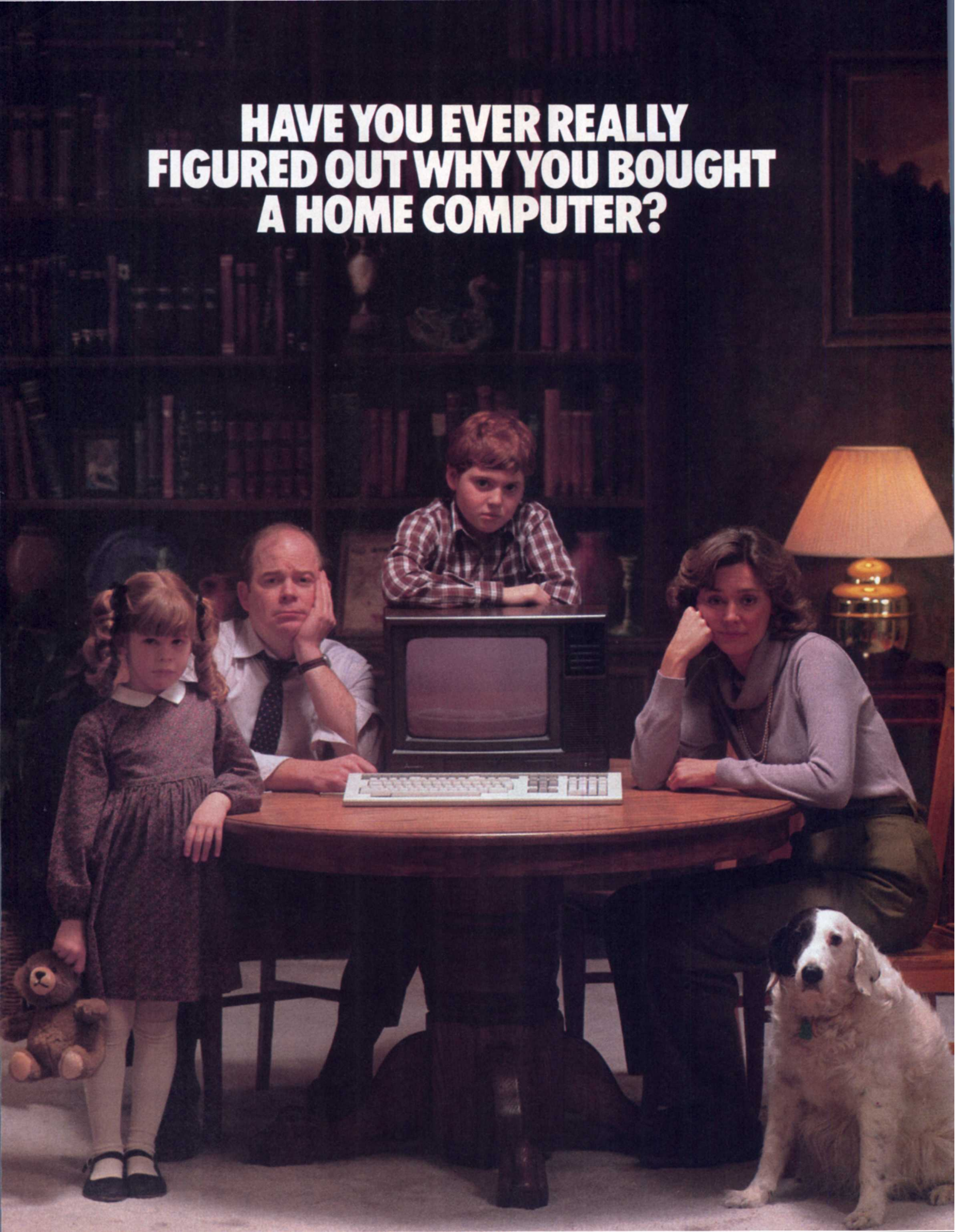
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can't really fault the Micro Decision for this difficulty with concurrent editing and printing operations. It has been noted by *WordStar* users with other computers, and quite simply, the problem seems to lie within *Wordstar* itself.

Correct-It, written by Aspen Software Company, on the other hand, is minimally adequate as a spelling checker and corrector. Its 36,000 word dictionary is rather limited and frequently lacks accommodations for plural forms of a word. It does, however, have the capability of creating auxiliary dictionaries housing up to 36,000 words. Hence, the more you use it, the more effective it eventually becomes.

Conveniently, the cursor control keys for LogiCalc are the same as those used in WordStar and echoed by Pearl.

Correct-It works by identifying and counting misspelled or unknown words in a first run through a text file. A second run then lets you: look-up, correct, store, or accept the spelling of the words in question. Since most of these functions are performed with just one keystroke, it is convenient to use, with one exception. *Correct-It* views each half of a hyphenated word as a separate entity, so you must run the program *before* you hyphenate or have a lot of correctly spelled words identified as misspelled.

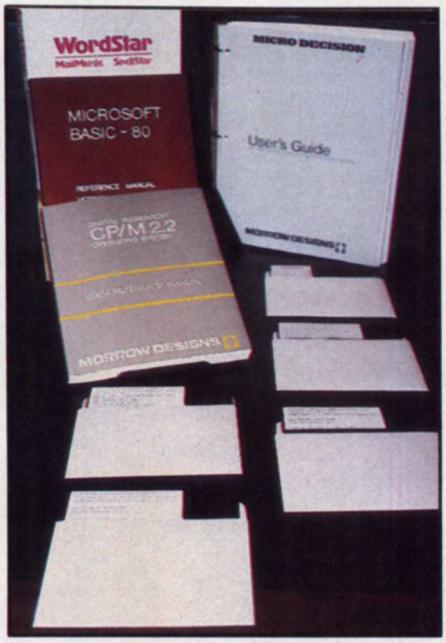
Another minor grievance I have with *Correct-It* is its lack of a word count function. This provision, included in MicroPro's corollary *(SpellStar)* would not have been difficult to include. But instead, *Correct-It* counts the number of *different* words in a document; something I have yet to find a use for—unless you like having your limited vocabulary flaunted.

Personal Pearl by Pearlsoft is the relational database program provided with the Micro Decision. In brief, it operates as a database manager by performing four main functions: create a form, create a report, enter data, and produce a report. An optional sort utility is also provided. Within this basic format, the data fields and definitions of data being collected are all user-defined, so that the scope of applications the program can serve seems limitless.

It does have several flaws, however. Anytime a change is made in a form, the index file must be updated. This isn't major, mind you, just an inconvenience. The program also lacks the programming required to skip over an empty data field in a report, as in a four-line report for mailing labels which is merged with a three-line data file. This, too, is a minor problem easily overcome with a little creativity on the part of the user.

Software Products International's *LogiCalc* is a spreadsheet program similar to *Calc Star* which performs financial analyses and forecasting on the Micro Decision. Ironically, the merits with this program have less to do with the program itself and more to do with the other software supplied with the Micro Decision.

LogiCalc works by taking text and numeric data and performing "what if" processing, linear regression forecasting, and file management functions. The screen display is small, showing only a portion of the spreadsheet at any one time. It does, however, run quickly on the Micro Decision.



Documentation and software provided with the Micro Decision.

Conveniently, the cursor control keys for *LogiCalc* are the same as those used in *WordStar* and echoed by *Pearl;* making the threesome a rudimentary kind of integrated system. More importantly, though, the "cells" of the spreadsheet, containing numbers, labels, or equations are capable of feeding directly into *Personal Pearl* for detailed reporting.

If you are a non-programmer, chances are you will appreciate the Pilot programming language provided with the Micro Decision, prized in many circles as one of the easiest programming languages to learn. This version is a derivative of the first Pilot, developed in the early 1970's at the University of California at San Francisco. Coined from the words: Programmed Inquiry, Learning, Or Teaching, Pilot is especially tailored to educational applications such as dialogs, drills, tests, and other forms of computer-aided instruction. Its primary hallmark lies in a very simple command syntax, one letter followed by a colon (t:, for example, means type). Once you become familiar with it, this interpreter will allow you to modify your system menus and write new ones.

The two basic interpreters included with the Micro Decision are a nice selection for programmers. Microsoft's Basic 80 is one of the most comprehensive interpreters available and widely respected as an industry standard. Moreover, it is relatively easy to learn, and a library of applications programs is available for it. BaZic, developed by Micro Mike's Inc., is compatible with the different programming world of North Star Basic; allowing low-cost programs written in North Star Basic to be run on this system without modification. BaZic is considered advantageous mainly for its channel-oriented I/O and file handling techniques.

Documentation

The system manual, supplied in a three-ring binder, reinforces Morrow's attempts to make computing easy for the novice. Written in clear, easy-to-understand English, it tells you quickly and to the point how to get the system up and running for the first time, making no assumptions about what you already know.

Complementing this tradition, the Pilot and *Personal Pearl* manuals (supplied in paperback book) are also excellent. Each is written with simplicity in an organized format and peppered with helpful examples throughout.

The system manual attempts to make computing easy for the novice.

Documentation for the remaining software, also supplied in paperback, is adequate. The *WordStar* and Microsoft Basic manuals are verbose, disorganized, and frankly confusing at times. Fortunately, however, there are many good books on the market to compensate. The documentation on *Correct-It* is meager but *very* easy to understand. At the other

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Micro Decision, continued...

extreme, the *LogiCalc* write-up is more substantial, but also more difficult to follow. BaZic seems to strike the happiest balance with a manual that is neither too brief, nor too complex.

Summary

Naturally, this small computer won't serve the needs of everyone. In my opinion, however, it is a very reliable, low-cost system, particularly for the novice. Although the software provided clearly does not represent the best available in each category, it does make the unit functional from the start, and at no additional expense.

Some people, I am sure, will fault the fact that it is not easily expandable. I haven't found this to be a problem, but nonetheless, it is true. You are limited by the board design to 64K of memory. And although there is a 40-pin I/O bus expansion port on the board, and it is possible to obtain more disk storage by extending the drive B ribbon cable, it is not practical to implement these features, nor are there any products currently available for this purpose. By the time you read this, however, there should be a hard disk version of the Micro Decision available, featuring, among other things, more disk storage and random-access memory.

There was a time not too long ago when $3000 was a good price for a general purpose, CP/M-based computer. Then the portables came along, almost halving the price and offering software in the bargain. With the dawn of the Micro Decision, the desktop arena has simultaneously been challenged with affordability and utility in a reliable, user-friendly machine. Who knows what the midday may bring? ENC

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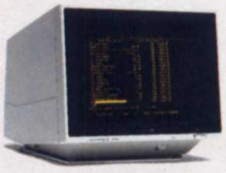

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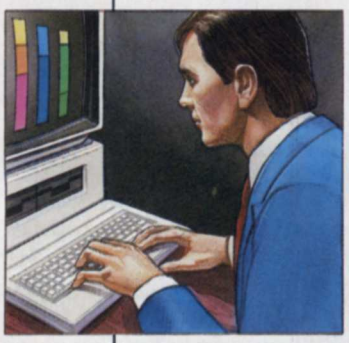

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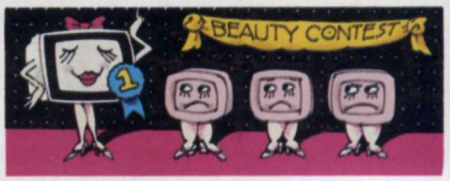

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Dr. Candoli reviews a letter the secretary has produced using her word processing system.

Teachers discuss the merits of a new courseware package.

The Board of Education foresaw the educational value and administrative practicality of bringing computers into the Fort Worth schools.

"In our schools, classroom computing extends beyond traditional concepts."

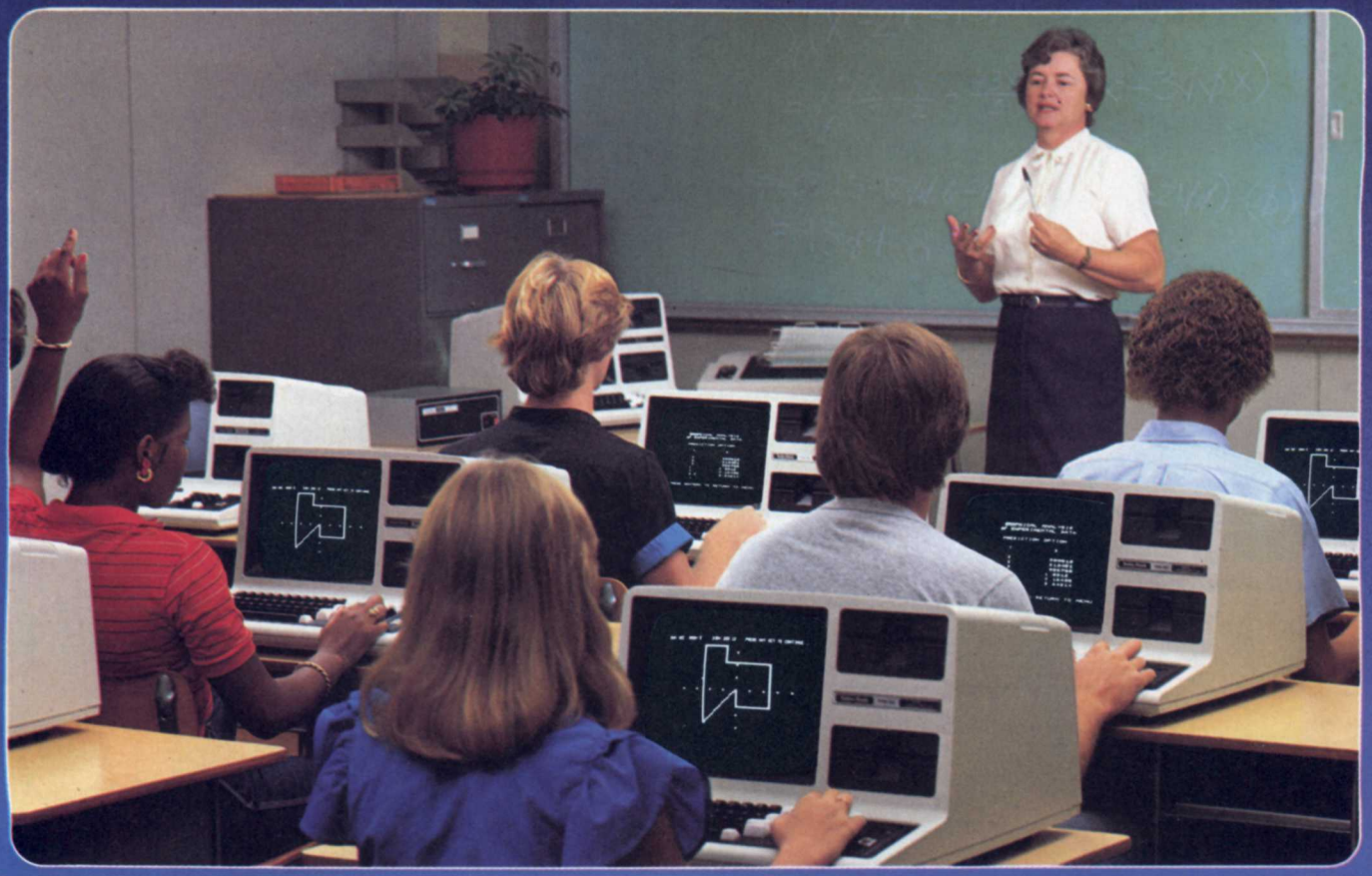
—Dr. Carl Candoli, Superintendent, Fort Worth Independent School District

A progressive concept is becoming a reality in the Fort Worth, Texas schools. Not long ago, officials here foresaw the microcomputer as a viable educational tool. Today, they are in the midst of an extensive development effort to make computer technology work for them—at all levels of the educational process. "We're trying to find the best ways to utilize computers in order to improve the educational process from both instructional and management standpoints," explains Crawford Johnson, Director of Computer Curriculum.

As tools for learning, TRS-80® computers are used by teachers to assist instruction and evaluation in fundamental subjects, such as math, reading and language arts. Dr. Richard Benjamin, Associate Superintendent, commends the use of microcomputers in the schools. "They allow individualized instruction," he says, "and they seem to be a motivational plus for most of our students."

To promote computer awareness, students are learning the functions, uses and impact of the computer. "We stress the importance of basic computer skills, including programming," Dr. Richard O'Neal, School Board President, says. And many schools in the district have set up shared learning systems, connecting as many as 16 non-disk computers to a teacher's disk system using TRS-80 Network Controllers.

As management tools, computers are used "to explore ways to reduce paperwork for educators so that they can spend more time on instruction," Dr. Benjamin relates. For example, computers will be



A shared learning system in this math class lets students easily choose from lessons that are stored on disk in the teacher's "host" computer.

A student finds the computer can be fascinating. She's also acquiring the skills needed to perform well in a computer-oriented society.

used to streamline grade compilation and recording. Administrative duties will be simplified using TRS-80s for word processing, data base management and financial planning. And computers will even be used to transfer school and student data between schools and the administrative offices.

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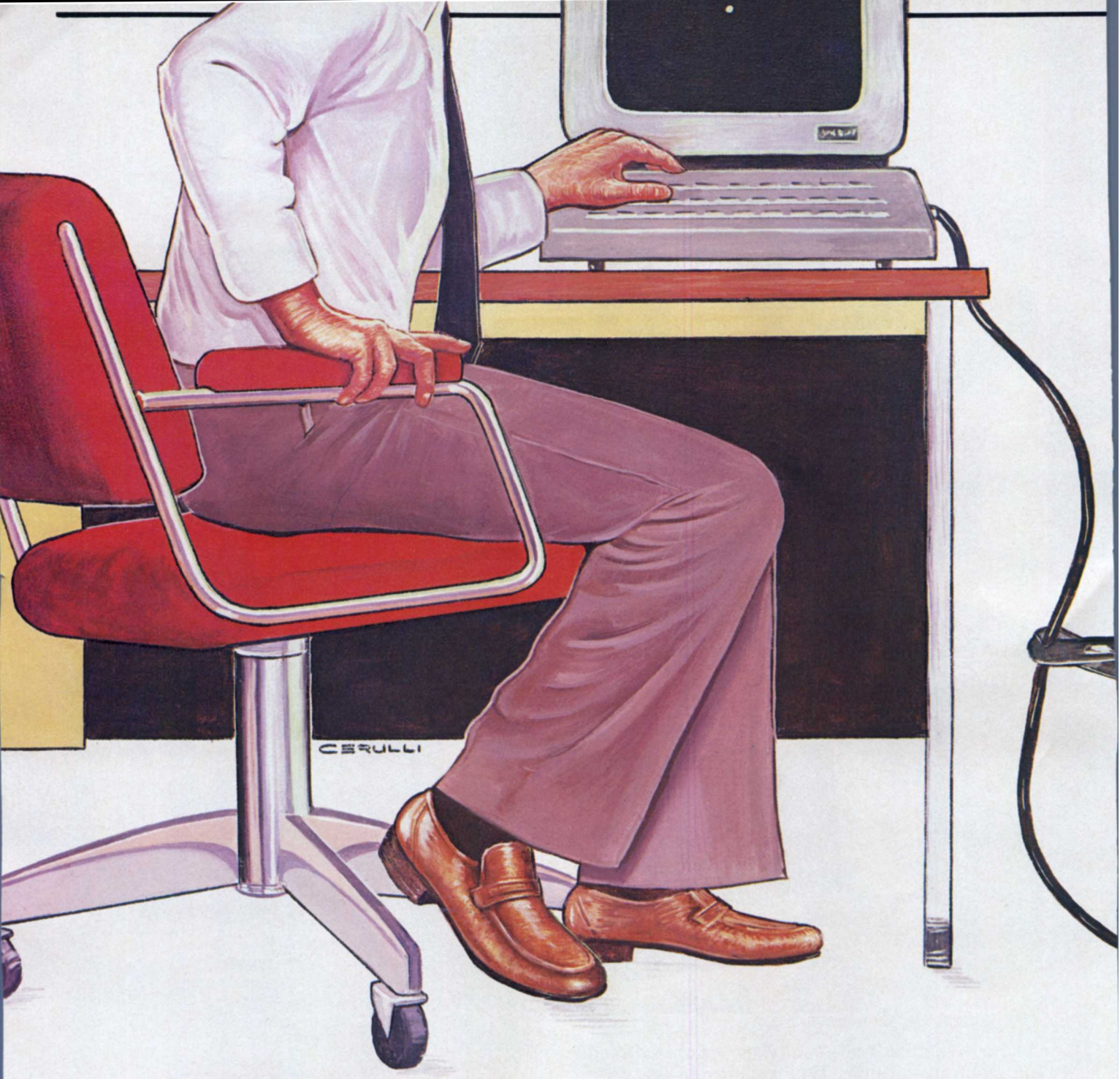

Protect Your Computer From

The Power Line Monsters

This article will help you decide which power line conditioner will best meet your needs.

David H. Ahl

The title of this article may sound somewhat silly. After all, you plug your computer into the power line; why would you want to protect it from the power line? Obviously you wouldn't—you want the voltage from the power company—but you don't want all those other things that hitch a free ride on the line such as surges, spikes, sags, and noise.

As people invest more and more money in their personal computers, they become more concerned about power line protection—and with good reason. One lightning bolt can wipe out an entire computer system, while much smaller disturbances can create disk read/write errors, blow out modems, erase portions of memory, or worse.

All the magazines, including *Creative Computing*, carry pages of ads for surge filters, power line conditioners, and uninterruptible power systems. Which one is for you? How can you evaluate these units? Do you need one at all? Read on.

Power Line Monsters

There are five major sources of trouble on the power line: blackouts, brownouts, long-duration transients, short-duration transients, and high frequency interference. You may not have all of them where you work or live, but chances are you are subject to one or two.

For example, *Creative Computing* is located in an area of light industry with an electrified railroad track within 15 feet of the rear of the building. Blackouts and brownouts are rare, but transients and noise (high frequency interference) are common. On the other hand, I live in a more rural area and can count on at least one blackout practically every week. Some are as short as a few seconds, but many last for several hours. In addition, my lights dim whenever an air conditioner or shop tool starts in any house on the road.

A blackout is a total interruption of power. Short blackouts (a few seconds) generally result from the utility company cutting in a different generator or making a repair to a line, whereas longer blackouts are due to trees pulling down lines, lightning striking a transformer, and the like. No computer can run through a blackout, short or long, unless it is attached to an uninterruptible power supply that kicks in the instant it senses a decline in power line voltage.

A brownout is a planned reduction in voltage by the utility company during a period of peak power

Illustration by Frank Cerulli.

consumption. They occur most frequently from 5:00 to 8:00 p.m. during the summer months when people return home and all turn on their air conditioners at once. During a brownout, the nominal voltage (120 v) may be reduced to as low as 102 volts, although 110 to 115 is more common. In general, such reductions should not affect equipment adversely since the normal operating range of most electronic equipment is 105 to 130 v. On the other hand, during a brownout, your system will be much more susceptible to transients.

We have loosely defined a long-duration transient as one lasting 100 microseconds or longer. It can be either a sag (drop in voltage) or a surge (increase in voltage). Probably the most common is a sag due to a heavy load coming on line, for example, an air conditioner compressor or shop tool. Electric motors require much more current when starting than when running; you have probably noticed a brief dimming of lights when a motor starts. Since the entire power network essentially is compensating for a sag, it probably will not drag the voltage down enough to affect your computer adversely unless, as we mentioned earlier, it occurs during a brownout. Since most power line protection equipment cannot handle this situation, during a brownout your best bet is to turn off your computer and read a book until voltage is back up.

A long-duration surge is most commonly caused by the utility company changing the makeup of the local power grid. In other words, a generating plant may be cut which causes a momentary increase. Or a large load may be shut down. In either case, the network quickly compensates and brings the voltage back to normal. Most power line protection equipment compensates for surges along with the next problem, spikes.

A short-duration transient, usually a spike, is one of the most common problems, and potentially one of the most damaging. There are many causes of spikes: lightning, short circuits, turning on and off large inductive loads, and major changes in network loading. Lightning is by far the most destructive short-duration transient. A lightning strike typically lasts two microseconds or less, but the amount of energy transmitted is astronomical. The only real protection against lightning is a well-grounded lightning rod—lightning arresters on TV antennas run a poor second—but even a lightning rod grounding a direct strike is likely to be carrying so much voltage that flashover strikes will jump to other grounded (and non-grounded) conductors.

While direct strikes may be rare, strikes in your general geographic area can be transmitted on power lines as high voltage spikes of 1000 volts or more. Best bet in a lightning storm: turn off your computer and unplug it.

A much more common cause of spikes is the turning off of a large inductive load such as a motor or transformer. The residual energy within the magnetic field of the device is transmitted over the power line and, depending upon the proximity and size of the device, could be as much as 5000 volts. Until the transformer core or motor winding is fully discharged (far less than one second), this transient will continue in an oscillatory manner. Smaller spikes, but bothersome nevertheless, are produced by turning on and off hair dryers, blenders, vacuum cleaners, and other small appliances. And general hash is created by small motors, fluorescent lamps, and the like.

High frequency noise is in a frequency range much higher than electrical current (60 Hz), usually from upper sound frequencies (7000 Hz) to 50 MHz or more. Since computers do many things in these frequency ranges (mpu cycle rates of 1 to 8 MHz, disk transfer rates of 50 to 500 KHz), excess noise can prove most annoying.

This noise is frequently called RFI (radio frequency interference) or EMI (electro-magnetic interference), but no matter what the name, the effect is the same: unwanted glitches. The noise can be transmitted through free space and picked up by a power cord acting as an antenna, or it can be carried directly on the line.

Power Line Protection

Manufacturers make a bewildering array of power line protection devices ranging from uninterruptible power supplies costing as much as $1000 (and more) to plug-in single line filters for under $5.00. For even less money, you can build your own device. Steve Ciarcia discusses power line pollution and how to build an inexpensive transient suppressor in an excellent article in *Byte*, December 1983. However, assuming you would rather buy a commercial one, what should you know to make a good decision?

A bewildering selection of power line protection devices is available.

We obtained eight devices typical of the many available. We did not get an uninterruptible power supply, so perhaps we should discuss it first. This is the ultimate device, and indeed the only one that can protect against blackouts and major sags. Most of them use a battery which is kept charged during normal operation. However, if the voltage dips below a predetermined level, the battery cuts in and keeps the computer running. For how long? Not forever. Some units give you an audible warning and then provide power for 20 minutes or so until you can shut down the system in an orderly manner. Others provide power for a few hours.

If you have a hard disk system and are in an area subject to frequent blackouts, you might want to follow the lead of one of my neighbors who has the ultimate system: an uninterruptible power supply and a gasoline powered motor generator set that can be turned on for any outage lasting longer than a few minutes.

What To Look For

When you go shopping for a power line conditioner, you will learn one thing very quickly: there are no universally-used standards of measurements in the industry. Unlike computers which can be measured in terms of kilobytes of memory, 8 or 16 bits, disk capacity, and so on, there are few such measures for power line conditioners.

As we mentioned above, there are five potential problems on the power line. The first, blackouts, can be cured only with an uninterruptible power supply. Ditto, sags, particularly during a brownout. And you can't really expect a power

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line conditioner to take the place of a lightning rod. What's left?

Surge Protection

Surge protection is most often provided by means of a device called a metal oxide varistor (MOV). When the voltage is lower than its conduction threshold, it is inert. However, the instant the voltage exceeds this threshold, it becomes a conductor and shunts the excess voltage to ground. This device is the primary mode of protection offered by most commercial surge protectors. Inexpensive units have only one MOV; however, for complete protection, you should select a unit with three MOVs, one across the line and one from each side to ground. Some manufacturers refer to this as common mode and differential mode protection.

Protection provided by MOV devices is most effective on spikes. It provides some protection against long-duration surges, but none at all against voltage sags.

Kalglo provides complete specifications on all of their units in comprehensible language. For example, the unit we tested, the DPC, has a 5 nanosecond response time, handles a pulse of 4500 amperes, and the clamping starts at 150 volts. Electronic Protection Devices provides a different set of specs (for the Lemon): forward surge of 1440 amperes for 1/120 sec., pulse power dissipation of 10,800 watts for one ms, clamping response 5 nanoseconds. Other manufacturers say similar things in different terms. We look forward to the day when we can easily compare apples with apples.

In shopping for a surge protection device, you should look for one with a fast clamping time (times from one picosecond to fifty nanoseconds are typical). The clamping voltage should be reasonably low, preferably under 180 volts, and the pulse current handling (amperes) and power dissipation (watts or joules) both should be as high as possible.

Noise Suppression

The most common noise suppression technique is to put one or more capacitors across the line. Noise at different frequencies is most effectively attenuated by capacitors of different values rather than one middle-of-the-road value. The Tripp Lite Isobar, for example, has both a capacitor for VHF attenuation and one for high frequency attenuation in parallel across each pair of outlets.

In addition to capacitors across the line, some units also have a filter consisting of one or more capacitors and a toroidal choke. Like capacitors alone, these filters are tuned to particular frequency ranges, and there may be more than one stage of filters in a unit.

Specifications on noise suppression are also a mixed bag. The Isobar spec sheet, for example, lists 6 db suppression at 500 KHz, 12 db at 1 MHz, and 30 db above 5 MHz. For their commercial grade Isolator line, Electronic Specialists lists 55 db attenuation from 100 KHz to 200 MHz. Ohm Electronics is more vague and specifies noise filtering of "more than 20 db, 2 to 100 MHz" for their Scooter XP4 Guard-It. When you have apples, oranges, and pears, it is tough to make comparisons.

Electrical and RF noise tend to be localized. If noise is a severe problem for you, when shopping for a noise suppressor, you should look for one with maximum attenuation (50 db or more) over a wide frequency spectrum. If you are in a "normal" environment, a suppressor with more modest protection will probably be sufficient.

Brownouts, Surges, and Sags

As mentioned above, the MOV spike protector will provide some protection against long-duration surges, but not against sags and brownouts. For this type of protection, you need a constant voltage transformer. This is found in only the larger, more expensive units.

The typical constant voltage transformer accepts input voltage over a range of 90 to 140 volts and, depending upon the output tap selected, can put out 110, 115, 120, or 125 volts. In commercial units, usually the 120 volt tap is selected and, after filtering, the final output is about 117 volts. Although constant voltage transformers are available separately, most typically they are part of a total package such as the Kleen Line Conditioner from Electronic Specialists. Such a unit provides all of the protection and suppression features discussed above.

When shopping for a constant voltage power supply, the main thing to look for is a unit with sufficient load handling for your computer and peripherals. While most computers alone use less than 20 watts, disk drives add another 20 watts, a color monitor as much as 120 watts, and a daisy wheel printer as much as 200 watts. Add a few more boards and peripherals, and you will be over 500 watts in no time.

From the many hundreds of protection devices available, you should be able to find one which meets your needs and your budget.

Circuit Breaker

Although most computers are fused, occasionally an internal problem develops in a non-fused component. In such a case, you would like current to the device to be cut off as soon as possible, both to prevent further damage and eliminate the possibility of a fire. To provide this protection, many power line protection devices, and even low-cost power strips, incorporate a circuit breaker.

Frankly, there isn't much difference between breakers—most have a current rating equal to the rating of the unit, say 15 amperes, and are able to interrupt up to 1000 amperes of fault current, i.e., a direct short circuit.

Some units use a fuse rather than a breaker—a fuse is slightly faster acting—but the amount of protection provided is roughly the same. If the unit you select uses a fuse, be sure to buy some extras to have on hand. There is nothing more maddening than to blow a fuse on a Saturday night and be down the rest of the weekend for want of a 15-cent replacement.

Extra Features

Beyond the basic features, many power line protection devices have one or more extra features. The most common—and most useful—is isolation

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of each receptacle on the unit. Since digital computing equipment is one of the major sources of electrical noise, it is desirable to isolate components, particularly computers and printers.

Another extra feature is the external switches. Most common is a switch for the entire unit, but some have switches for each bank of receptacles, each pair, or even each individual receptacle.

Indicator lights are another extra feature. Again, the most common is one indicator to show when the unit is on. Some units have a status light to show when everything is operating correctly and/or to indicate a trouble condition.

Not exactly a feature, but something that differs among the various units, is the method of mounting. Some units are designed simply to sit on the floor or a table. Others have brackets for floor, wall, or under table mounting. Several of the units are designed to plug directly into a dual wall receptacle and provide up to six outlets.

You also should look at the arrangement of the outlet receptacles before you buy. If your computer (or a peripheral) has a power transformer that plugs directly into a receptacle, the transformer may cover as many as four receptacles on some power protection devices. On the other hand, if all of your components terminate in standard plugs, this is of little concern, except, of course, you must have a receptacle for each plug.

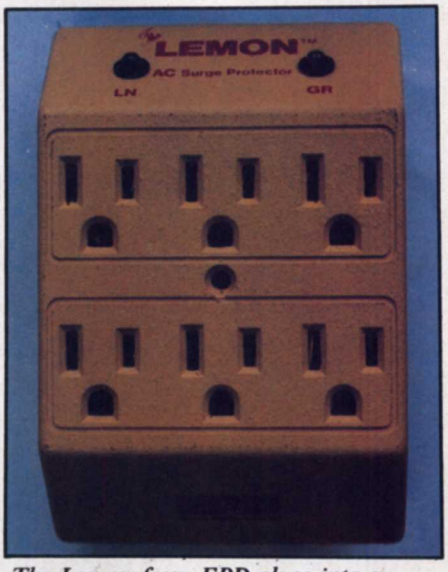
Other differences are largely cosmetic: color of case, type of outlets and switches, and length of cord. As mentioned earlier, prices range from $5 to over $1000, although, as with most things, you get what you pay for.

We used a variety of different devices for several months and found that they functioned as advertised. On the other hand, we did not have the facilities to subject them to an exhaustive set of tests, but simply used them in our normal working environment. Presented below is a short description of each of the devices we used.

There are many hundreds of protection devices available, from which you should be able to find one that meets your needs and your budget. At the end is a list of manufacturers that you can contact for more information.

Electronic Protection Devices

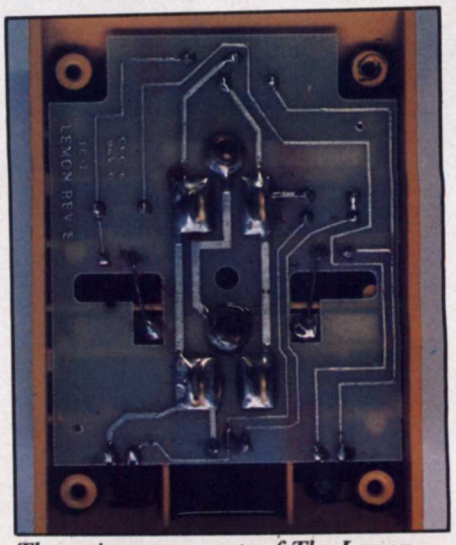
Electronic Protection Devices (EPD) has a line of colorful devices known as the Lemon, Orange, Peach, and Lime. If the colors offend you, they are also available in plain vanilla (light gray).



The Lemon from EPD plugs into a duplex wall outlet and provides surge protection for six receptacles.

We used the Lemon ($59.95) which is an AC surge protector. The Lemon plugs into a double wall outlet and provides six receptacles. It has a forward surge rating of 1440 amps for 1/120 second, peak pulse power dissipation of 10,800 watts, clamping response time of five nanoseconds, and three MOVs (across the line and line to ground). Operational rating is 15 amps, and it has two indicators to show normal operation or circuit failure.

EPD makes an extensive line ranging from the Kiwi, a single outlet device ($19.95) to the Grizzly, an uninterruptable power system available in 200, 500, and 1000 watt configurations. An interesting new device in the EPD line is the Ground Hog, a static dissipative mat designed to be placed under a computer and hooked to ground.



The active components of The Lemon are hidden under a small PC board.

Surge Purge

Like the Lemon, the Surge Purge from Citel America, Inc. plugs into a grounded duplex outlet, although the outlet cover plate is left on. The unit provides two pairs of outlets with, unfortunately, rather tight spacing. A transformer plugged into one will block the adjacent outlet. A red LED is always on indicating that power is applied to the unit.

Citel Surge Purge plugs into a duplex wall outlet.

As its name suggests, Surge Purge provides protection against surges. Response time is under one microsecond and it grounds out spikes exceeding 220 volts. In case of a gross surge, the unit switches off power after 15 seconds whereas a spike is "extinguished" in less than one-half cycle (120th of a second) and power is not interrupted.

Networx

From Networx, we used the Wire Tree, a four-outlet filtered power source. This provides surge protection and noise filtering. It uses one MOV for surge protection and a capacitor/toroid pi fil-

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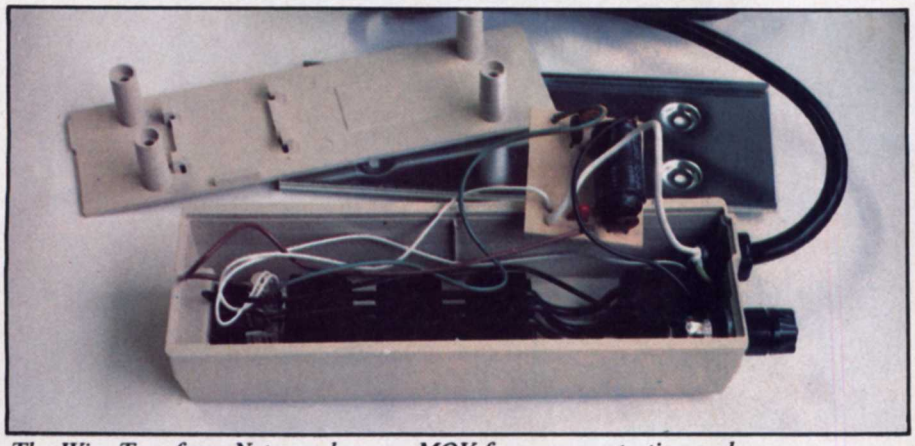
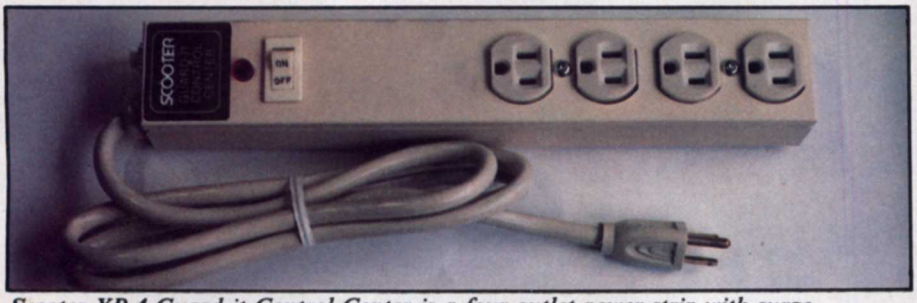


The Wire Tree from Networx has one MOV for surge protection and capacitor/toroid network for RFI/EMI filtering.



Scooter XP-4 Guard-it Control Center is a four-outlet power strip with surge protection and RFI/EMI filtering.

ter for noise filtering. Noise attenuation is 20 db from 600 KHz upward, and a minimum of 50 db from 2.8 MHz to 40 MHz.

The Wire Tree is a compact unit with a nine-foot cord, lighted rocker power switch, and 8 amp fuse. One of the four receptacles allows extra space for plugging in a transformer.

Scooter Guard-It

The Scooter Guard-It from Ohm Electronics is a surge protector/noise filter. It has three MOVs for both common and differential mode protection. Clamping occurs at 225 volts, and peak current is 6000 amps. Noise filtering, provided by the use of two toroids and capacitors, is more than 20 db from 2 to 100 MHz.

The unit has four outlets, rocker power switch, power indicator light, and 15-amp circuit breaker. It can be mounted in any position and has a six-foot cord.

Tripp-Lite Isobar

Tripp Manufacturing has been making special lighting equipment since 1922, and today offers a comprehensive line of electronic power equipment such as precision regulated power supplies, line stabilizers, uninterruptible power supplies, and line filters.

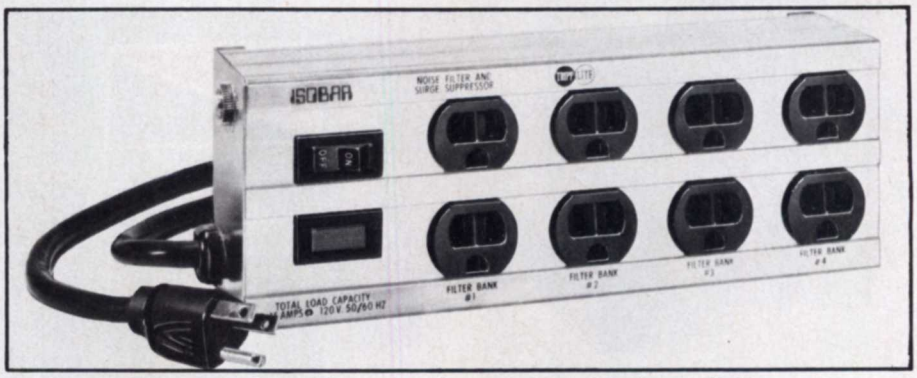
The Isobar is termed a line filter; we tested the model with four double outlets ($97.95). Two- and four-outlet versions are also available. The eight-outlet unit has three MOVs for surge protection, four pi filter banks (one for each pair of outlets) with a torroidal choke and two capacitors in each for filtering. Four pairs of capacitors provide noise suppression in the high frequency and VHF ranges. Clamping starts to occur at 140 volts and response time is five nanoseconds.

The unit is housed in a heavy aluminum case which can be mounted in any position. It has a 15-foot cord, lighted rocker switch and 15-amp circuit breaker. Load handling is 1875 watts.

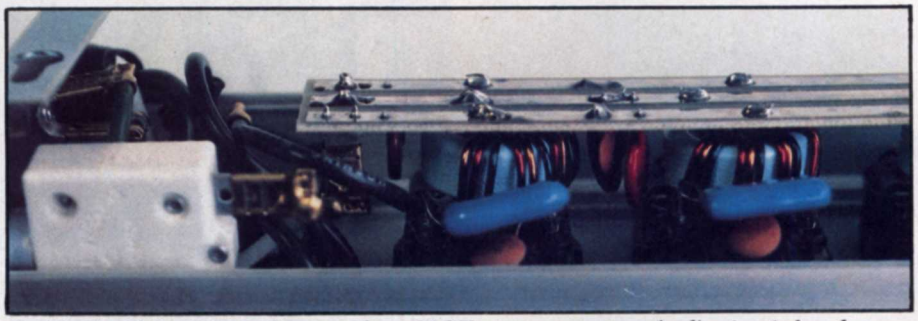
The Max from Panamax

The Panamax Voltage Surge Suppressors, nicknamed "The Max" provide surge suppression and optional noise filtering. At 5 picoseconds, clamping

The Max has a power switch, indicator light, fuse, and four noise and surge protected outlets.



Tripp Lite Isobar strip has eight receptacles, switch, and indicator light.



Inside the Tripp Lite Isobar are three MOV surge protectors (red), circuit breaker (white, left), and a pair of filter capacitors (blue and beige) and toroidal choke for each pair of receptacles.

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time is one of the faster available; clamping level is 200 volts. Maximum spike current is 5000 amps and energy dissipation is 1 million watts. Noise filtering is provided in both the common and differential mode. Frequencies from 10 KHz to 100 MHz are attenuated from 12 to 70 db.

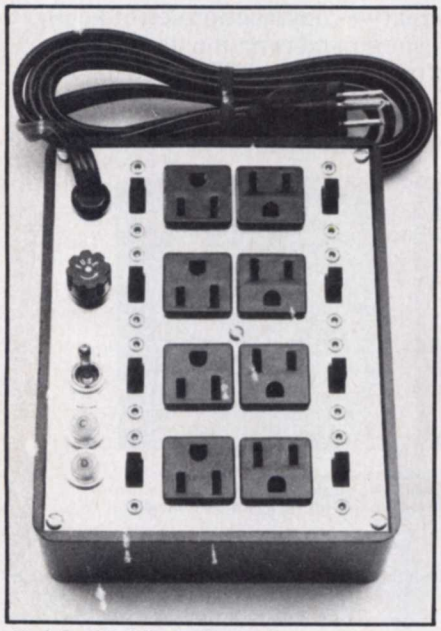
The Max is available with one, two, four, and six outlets. We used the four-outlet version which has a lighted rocker power switch, indicator light that shows correct operation, fuse, and six-foot power cord.

Panamax also makes an interesting device, the UVRA, an under voltage reset alarm that sounds an alarm and cuts off power when the voltage drops below a safe operating level. Another device, the PowerMax, provides battery backup power for 15 minutes.

Kalglo Spike-Spiker

As a well-established manufacturer of AC power controls, high wattage dimmers, motor speed controls, load limiting devices, and alarm systems, it was only natural that Kalglo Electronics should enter the protection field. Their line includes four "power consoles" and six units that plug directly into an outlet (no cord). We tried the Deluxe Power Console Plus (DPC+).

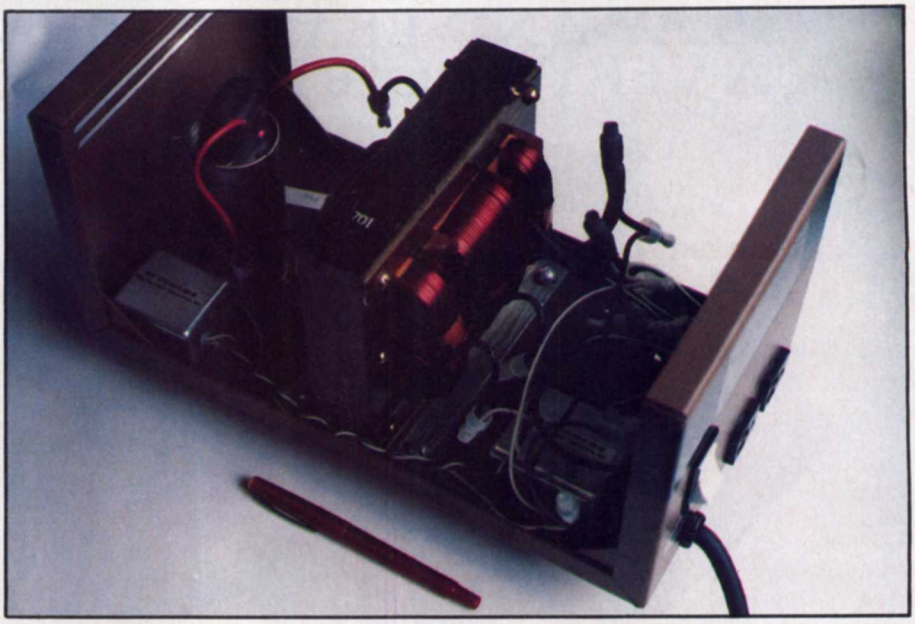
The DPC+ is a surge suppressor and noise filtering device. It has eight individually switched outlets divided into two banks of four outlets each. The unit also has a main on-off toggle switch, 15-amp fuse, and two indicator lights, one each for the common and differential mode surge protection circuits.



Kalglo DPC+ Spike Spiker provides surge protection and RFI/EMI filtering. Each of the eight receptacles is switched and two indicator lights indicate correct operation.

Voltage spikes are protected in six progressive stages on both common and differential modes with an initial clamping level of 131 volts and response time of one picosecond. The DPC+ can handle a pulse surge of 18,200 amperes. Noise filtering is provided by using inductive/capacitive series-parallel low-pass networks in five stages on both common and differential modes.

The unit is designed to be used on a table top since that gives the user access to the individual switches; we found this feature quite convenient. It has a seven-foot grounded cord. Other power consoles in the Kalglo line have four to eight outlets and varying levels of protection.



Constant voltage transformer in the Electronic Specialists Kleen Line Conditioner is a massive unit that compensates for power dips. The unit also provides surge protection and RFI/EMI filtering.

Kleen Line Conditioner

Electronic Specialists, Inc. is one of the pioneers in making devices for the protection of high technology products. Their 40-page catalog lists a broad line of devices such as power line filters, spike suppressors, isolators, interrupters, regulators, and wire-in devices.

We tried one of the top-of-the-line devices, the Kleen Line Conditioner. This is a regulator/filter/suppressor and is one of the only devices that compensates for brownouts and voltage sags. Input voltage can range from 90 to 140, but output voltage is always 117 volts plus or minus four percent. Furthermore, the output waveform has no more than 3% harmonic distortion.

Kleen Line conditioner from Electronic Specialists.

Protection against surges is provided; clamping voltage is 200; spike current can be 6500 amps with peak pulse power an astounding 4,300,000 watts.

Two sets of noise filters are employed: a balanced pi network for the differential mode with 50 db attenuation in the frequency range of 70 KHz to 200 MHz and an L/C network for the common mode with 30 db attenuation from 100 KHz to 200 MHz.

Four Kleen Line models, which handle from 250 to 2000 watts, are available. As might be expected with constant voltage transformers inside, they are big and heavy. We had the 250 watt unit which measures 14" x 8" x 7" and weighs 31 pounds. It has a six-foot cord and two receptacles. END

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Warranty information available upon request by writing to: Reader's Digest Services, Inc., Microcomputer Software Division, Pleasantville, N.Y. 10570.

Speedy Spides runs on Apple®II, II Plus, IIe: 48K and disk drive and Commodore 64™ and disk drive. Use of paddles optional.

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Manufacturers Of Power Line Conditioning Equipment

Product Key

- A Devices for surge protection and/or RFI/EMI filtering
- B RFI/EMI filters
- C Uninterruptible power supplies
- D Constant voltage power supplies
- E Isolators
- F Regulators

Product Key	Manufacturer	Reader Service Number
C	Bits Power Systems 11020 Audelia Rd. Dallas, TX 75243 (214) 340-1209	402
A	Citel America, Inc. 776 W. Lancaster Ave. Wayne, PA 19087	403
A	Com-Protect Rt. 4, Box 427x Slidell, LA 70458 (504) 641-1316	404
A	Computer Accessories Corp. 7696 Formula Pl. San Diego, CA 92121 (619) 695-3773	405
A	Computer-Mate, Inc. 1006 Hampshire Lane Richardson, TX 75080 (214) 669-9370	406
A	Computer Power Solutions, Inc. 8800 49th St. North, Suite 203 Pinellas Park, FL 33565 (813) 544-8801	407
A	Computronix Corp. P.O. Box 1425 Melville, NY 11747	408
B	Corcom, Inc. 1600 Winchester Rd. Libertyville, IL 60048 (312) 680-7400	409
C	Cuesta Systems, Inc. 3440 Roberto Ct. San Luis Obispo, CA 93401 (805) 541-4160	410
B	Curtis Industries, Inc. 8300 North Tower Ave. Milwaukee, WI 53223	411
A	Discwasher 1407 N. Providence Rd., Dept. CC Columbia, MO 65205 (314) 298-9626	412
A	Dymarc Industries, Inc. 21 Governor's Ct. Baltimore, MD 21207 (301) 298-2629	413
A,C	Electronic Protection Devices P.O. Box 673 Waltham, MA 02254 (617) 890-2518	414
A,B,D,E	Electronic Specialists, Inc. 171 South Main St. Natick, MA 07160 (617) 655-1532	415
A	Exlin 4888 Ronson Ct. Sn Diego, CA 92117 (619) 571-3134	416
A,C	Genisco Technology Corp. 18435 Susana Rd. Rancho Dominguez, CA 90221 (213) 537-4750	417
A	Gould Electronics 2727 Kurtz St. San Diego, CA 92110 (619) 291-4211	418
B	Hopkins Engineering Co. 12900 Foothill Blvd. San Fernando, CA 91342 (213) 361-8691	419
A,D,E,F	Isoreg Corp. 410 Great Rd. Littleton, MA 01460 (617) 486-9483	420
A	Kalglo Electronics Co., Inc. 6584 Ruch Rd. Bethlehem, PA 18017 (215) 837-0700	421
A	Kensington Microware 251 Park Ave. South New York, NY 10010 (212) 475-5200	422
A	J.W. Miller Division Bell Industries 19070 Reyes Ave. Rancho Dominguez, CA 90224 (213) 537-5200	423
A	Networx 203 Harrison Pl. Brooklyn, NY 11237 (212) 821-7555	424
A	Ohm Electronics P.O. Box 368 Palatine, IL 60067 (312) 359-5500	425
A,C	Panamax 150 Mitchell Blvd. San Rafael, CA 94903 (415) 472-5547	426
A	PMC Industries Inc. 9353 Activity Rd. San Diego, CA 92126 (619) 695-3520	427
B	The Potter Company P.O. Box 337 Wesson, MI 39191 (601) 643-2215	428
A	Power Integrity Corp. 2444 N. Pulaski Rd. Chicago, IL 60639 (312) 342-7454	429
C	PTI Industries 320 River St. Santa Cruz, CA 95060 (408) 429-6881	430
A,C	RKS Industries 4865 Scotts Valley Dr. Scotts Valley, CA 95066 (408) 438-5760	431
A	Seimens Corp. 186 Wood Ave. South Iselin, NJ 08830 (201) 321-3400	432
A	SGL Waber 300 Harvard Ave. Westville, NJ 08093 (609) 456-5400	433
C,E,F	Sola Electric 1717 Busse Rd. Elk Grove Village, IL 60007 (312) 439-2800	434
B	Sprague Electric Co. 7 Marshall St. North Adams, MA 01247 (413) 664-4411	435
B	Stanford Applied Engineering 3520 De La Cruz Blvd. Santa Clara, CA 95050 (408) 988-0700	436
A,C	Sun Research Inc. P.O. Box 210 New Durham, NH 03855 (603) 859-7110	437
C	Topaz 9192 Topaz Way San Diego, CA 92123	438
A,C,F	Tripp-Lite 500 North Orleans Chicago, IL 60610 (312) 329-1777	439
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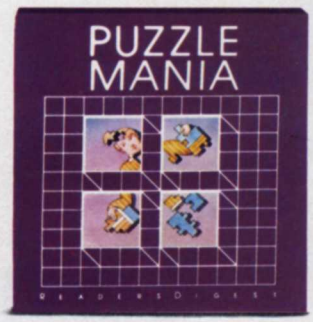

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Each Puzzle Mania puzzle (including your own creations) can be played on six levels of difficulty. There's help when you need it. And all turns are tallied. So you can turn the puzzle play into competitive play. If you have to part with a puzzle before it's finished, there's a stop-and-save feature built into the program, too.

Reader's Digest Software™ created Puzzle Mania for kids and their friends and their parents and their grandparents and everybody else who likes fun and games. Look for it at your software store or call Customer Service at 800/431-8800. (In NY, AK, HI: 914/241-5727.)

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Warranty information available upon request by writing to: Reader's Digest Services, Inc., Microcomputer Software Division, Pleasantville, N.Y. 10570. Puzzle Mania runs on Apple® II, II Plus, IIe: 48K and disk drive. Commodore™ 64 Machine and disk drive. Color monitor required. IBM® PCjr version available late spring. Puzzle Mania and Reader's Digest Software are trademarks of The Reader's Digest Association, Inc. Apple is a registered trademark of Apple Computer, Inc. Commodore is a trademark of Commodore Electronics Limited. IBM is a registered trademark of International Business Machines, Inc.

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creative computing equipment evaluation

Rana Elite Disk Drives

Stephen Arrants

Once you have moved up from cassette storage, you wonder how you ever coped without a disk drive. The only thing that cassettes have going for them is price.

Cassette recorders are serial access devices. The search is through the entire tape for the data. Disk drives are random access. The disk drive looks at the table of contents, finds where the requested file is stored, and loads it. Disks are much more reliable, hold more information, and are much quicker than cassettes.

You probably started out with a single drive, which is adequate for most applications. Sooner or later one drive feels too confining, however. Most word processors and database software packages require two drives. With so many drive manufacturers producing for the Apple, choosing an additional drive can be confusing. Three new Apple drives from Rana Systems make this task easier.

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HARDWARE PROFILE

Product: Elite One, Two, and Three Disk Drives

Type: 5¼" disk drives

System: Apple II, II+, IIe; Franklin Ace

Specifications: See chart

Performance: Flawless; quick & quiet

Ease of Use: Very easy to install

Documentation: Good, though some sections are too technical

Price: $349; $549; 649

Summary: A great product line at good prices. Rana Systems has a good reputation for reliability and support.

Overall Mark: A+

Manufacturer:
Rana Systems
21300 Superior St.
Chatsworth, CA 91311
(213) 709-5484

Specifications

The Elite series from Rana offers a good choice of storage capacity and extra features. The Elite One single-sided drive provides 40 tracks. The Elite Two is a double-sided drive with 80 tracks. The Elite Three is double-sided, double-density with 160-track capacity.

All drives are housed in a rugged, attractive case measuring 6.8" x 9.25" x 4.5". The units are about one inch higher than the standard Apple drives. Thus, they may not fit in some enclosures and cabinets designed for the Apple Disk II.

Each drive has a special touch-sensitive write-protect switch mounted on the front of the unit. If a disk is not write-protected, simply pressing the switch will prevent the drive from writing on it. This feature might seem unnecessary to some users. I, however, have lost too many programs by designating the wrong drive or forgetting to attach a write-protect tab, and this feature gives me great peace of mind. Of course, a disk with a write-protect tab is always write-protected.

Rana offers the Elite controller card as an option. This permits the attachment of up to four drives per controller as opposed to the normal two. In addition, the controller card lets you boot old 13-sector DOS disks without control card jumpers or pre-boot disks. When

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64K of RAM

Ulc Upper & lowercase

Typewriter-style keyboard

12-key numeric pad

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a DOS 3.2 disk is booted, the Elite controller recognizes the older DOS automatically.

The Elite controller is necessary for another reason, too. Some protected software may not recognize the extra storage capacity of the Rana drives, and the Rana software enhancements cannot be transferred to those disks. The Elite controller card contains a special EPROM that will allow protected software to boot and to read/write to the extra tracks.

Drive installation is very easy. You simply attach the cable to a Disk II or Rana controller and install the controller in slot 5 or 6.

To use the extra capacity of these drives, Rana supplies special software. The enhancements to Apple DOS 3.3 consist of five utilities: FORMAT, CLONE, PROFILE, ENHANCE, and FID ENHANCE.

FORMAT is used for initializing new disks for use under DOS. The enhanced version supplies you with the ability to format disks ranging from 143K for a Disk II all the way up to a 652K Elite Three disk.

CLONE makes exact one-for-one copies of disks. In addition to full disk copying, CLONE will copy just DOS from one disk to another so that an old disk can be updated with the enhanced operating system.

PROFILE gives you the flexibility to redefine the arrangement of the drives in your system to suit your needs. Since the enhanced DOS must know what types of drives are connected to which controller, PROFILE is used to tell DOS of any rearranging you wish to do.

Both ENHANCE and FID ENHANCE are one-time utilities. They contain the various modifications that must be made to standard Apple DOS 3.3 and the FID utility for the system and utility to use the extra features of the Elite drives.

If you operate CP/M 2.2, you will use the CP/M utilities: FORMAT, COPY, PROFILE, SGLDRIVE, and ENHANCE.

FORMAT, PROFILE, and ENHANCE are similar to those provided for DOS 3.3. COPY is a CP/M version of CLONE.

SGLDRIVE is a special utility for users who have only one drive. Several CP/M utilities, such as PIP, were not written for single-drive systems. SGLDRIVE fools these utilities and CP/M into thinking that a single drive is actually two drives.

Documentation

Each drive comes with a manual explaining installation of drives and controller. Some sections are very technical, but that information is not needed to use the drives; it is provided for advanced programmers and not for the average user. The User Manual includes complete instructions for using the DOS and CP/M enhancement utilities without becoming too involved in the technicalities of these operating systems.

Elite Drive Specifications

	One	Two	Three
Capacity	163K	326K	652K
Number of Heads	1	2	2
Number of Tracks	40	80	160
Sectors/Track	16	16	16
Track Density	48 TPI	48 TPI	96 TPI
Rotational Speed	295 RPM	295 RPM	295 RPM
Mean Time Between Failures	9200 hrs.	9200 hrs.	9200 hrs.
Price	$349	$549	$649

If the Elite drive controller is purchased with an Elite drive, add $100. The controller is sold separately for $125.

The Elite Three needs special disks with a higher track per inch density.

Taking A Test Drive

You might think that testing a disk drive is simple. After all, it either works or it doesn't. But since speed and reliability are the factors that have inspired you to buy a disk drive, these are the things you should examine carefully.

To test speed, I loaded an 80-sector file from both a Disk II and an Elite drive. The rotational speed of an Apple Disk II drive is about 200 rpm; for the Elite drive it is about 295 rpm. The Disk II loaded the file in approximately two and a half minutes. The Elite drive was a bit faster, completing the job in just under two minutes. A thirty-second decrease in load time may not appear to be a significant factor, but remember that if a drive is faster, it is in use less often and the drive mechanism is under less stress. On the other hand, faster speed could cause more read/write errors. Is a faster drive less reliable?

Reliability is a bit more difficult to test. Drives usually do not fail in the first week of use. If you regularly clean the read/write head and have it aligned periodically, a disk drive should last a long time.

The "stress test" I use is an Applesoft program that loads eight successive graphics images in a continuous loop. The read/write head moves from the catalog track to the file to be BLOADed and then cycles back to the catalog track for the next BLOAD. If a disk error occurs, an error message prints out telling me where the error occurred and at what time. For example, DISK I/O ERROR BLOADING GRAPHIC 4 AT LOOP 16 would tell me that the drive failed to read the GRAPHIC 4 file the sixteenth time it was called. I could then determine how long it took for the drive to fail. Neither my aging Disk II nor the Elite drive failed after three hours of testing.

To Buy Or Not To Buy

Both the Elite One and Two will boot regular Apple disks. Single-sided disks can be used with the Elite Two, but remember that only one side is certified by the manufacturer. Some educational and games software packages write scores and other information to the disk. They should perform without any errors, since the DOS they use recognizes only one side of the disk. The Elite Three needs special disks with a higher track per inch density.

Rana's Elite series are well made and rugged disk drives suitable for any application. They offer features lacking on other drives, and the DOS and CP/M enhancements make disk use much easier. If you need additional data storage yet don't want to move up to a hard disk, an Elite drive is an excellent choice. Rana offers a standard 90-day warranty. Service and support are excellent. If you need additional data storage that is quick, quiet, and reliable, look for the Rana Elite series. END

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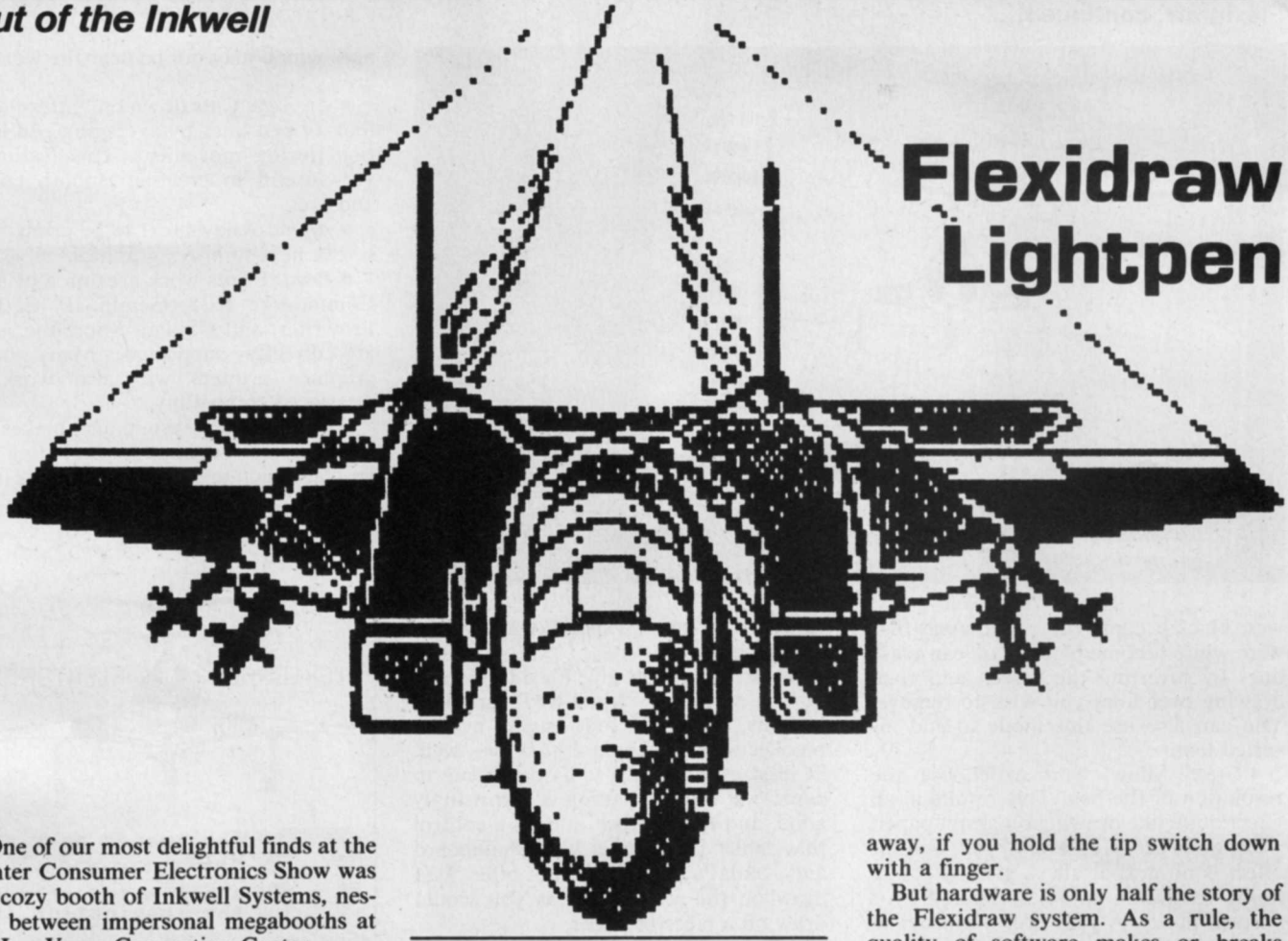
Flexidraw Lightpen



John J. Anderson

One of our most delightful finds at the Winter Consumer Electronics Show was the cozy booth of Inkwell Systems, nestled between impersonal megabooths at the Las Vegas Convention Center.

Inkwell was demonstrating Flexidraw, its lightpen/software system for the Commodore 64 computer. A caricature artist was using the pen to ply her trade, then printing the results out on an Oki printer and giving them to her subjects (victims?) as souvenirs.

The caricatures did much to show the potential of the Flexidraw system, and we were quite impressed. It was hard for me to believe, at least at first, that the system is built around the Commodore 64. The monochrome graphics capability looked more like it had come from an Apple Lisa or Macintosh than a C-64.

Without a doubt, the potentials of Flexidraw are the most promising of any hardware/software graphics system for the Commodore 64. The light pen itself, which plugs into joystick port 1, is sturdy and of high quality with a metal barrel and spring-sensitive tip switch. Its resolution is excellent, and its sensitivity remarkable. You can smoothly and clearly sign your name on the CRT screen with the pen held about a foot away, if you hold the tip switch down with a finger.

But hardware is only half the story of the Flexidraw system. As a rule, the quality of software makes or breaks good quality hardware. I am most happy to report that the Flexidraw system succeeds on this account as well. The software is bug-free, powerful, and easy to use.

Upon boot-up, you calibrate the light pen using a simple, painless procedure. Then the program proceeds to the drawing work areas.

Total screen area available consists of 320 pixels horizontally by 200 pixels vertically, or alternately 40 character blocks by 25 text lines. The screen area available for graphics is on the lefthand side, with a dynamic menu selection down the righthand side. *Two* work area screens are available simultaneously. This allows for more sophisticated graphics manipulation as well as a sort of macro definition, wherein pictures from one screen can be pulled into the other.

Some of the more powerful features of Flexidraw are as follows:

• *Invert:* Allows you to reverse the screen image so all screen areas that

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SYSTEM PROFILE

Name: Flexidraw

Type: Lightpen-based monochrome graphics package.

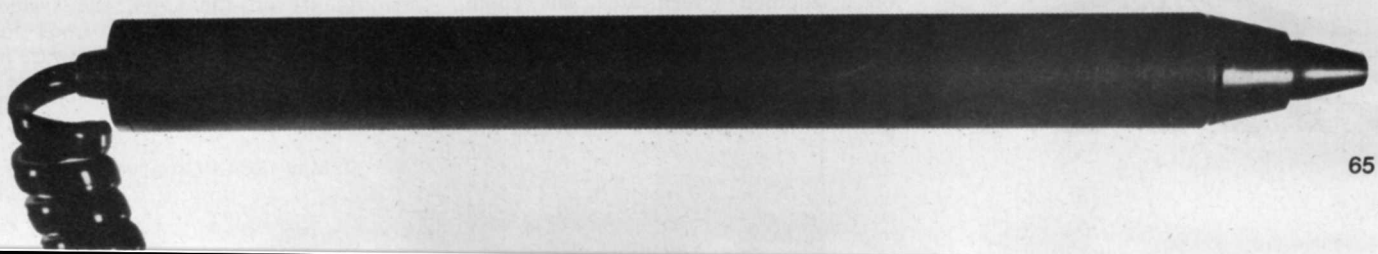
System: Commodore 64.

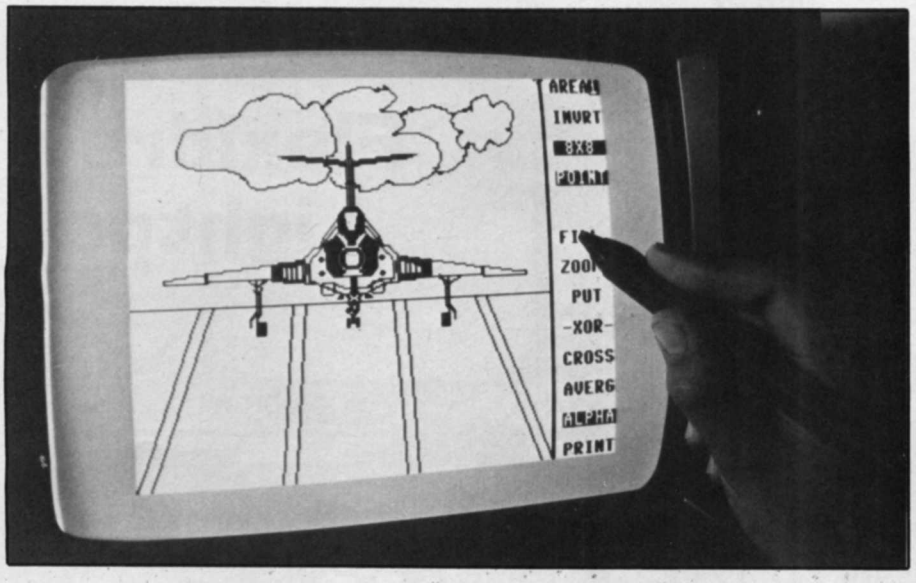
Format: Lightpen hardware plus disk-based software.

Summary: A taste of high-end graphics packages for a low-end price.

Price: $150

Manufacturer:
Inkwell Systems
P.O. Box 85152 MB290
7760 Vickers St.
San Diego, CA 92138
(619) 268-8792.





were black become white, and areas that were white become black. You can erase lines by inverting the screen and then drawing over lines you wish to remove. You can also use this mode to add inverted text.

• *Grid:* Allows you to choose the resolution of the pen. This results in an effect quite like drawing on graph paper. *Pixel* gives access to every pixel, and the effect is no grid at all. A grid of 16 x 8 limits resolution to 16 horizontal by 8 vertical pixels. A grid of 8 x 8 provides higher resolution while allowing for perfect horizontals and verticals.

• *Sketch/Spray:* Gives you the ability to draw freehand in a continuous line or in stipple "spray."

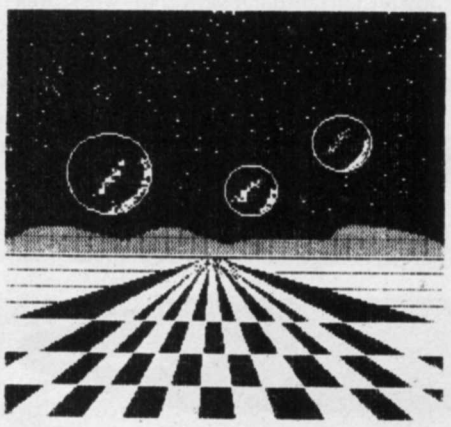
• *Point-to-Point:* By selecting the two points required for a line, circle, or box, you can use this feature to create the desired geometric shape instantly.

• *Get/Put:* Using the point-to-point command, you can define a rectangle to "get" or "put" shapes interchangeably on the work area screens. This feature is available only from the "grid" mode and functions in three ways. It can overlay an existing graphic, erase all "underneath" it, or act in a special way to erase inverse lines.

These commands give Flexidraw some of the power of "windowed" graphics systems, and at first sight evoked recollections of Apple *LisaDraw*—well, at least as close as a C-64 can come to *LisaDraw.* The resolution is surprisingly good, and the lightpen affords a control that tablet peripherals like Chalkboard and KoalaPad simply cannot offer. You draw on the screen, just as you would draw on a piece of paper.

• *Rubber Band:* Similar to point-to-point drawing, except that after the first point is set, a line is continuously drawn from the set point to the cursor. This gives you a chance to preview the line before choosing its final location.

The resolution is surprisingly good, and the lightpen affords a control that tablet peripherals simply cannot offer.



• *Fill* and *Shade:* Can be used to fill any totally enclosed area with black or any of ten different shading patterns.

• *Zoom:* Allows the work area to be expanded so that a pixel is depicted at the size of a character block. In addition to the ability to draw and erase directly on a zoomed screen area, the zoom screen can be scrolled horizontally and vertically.

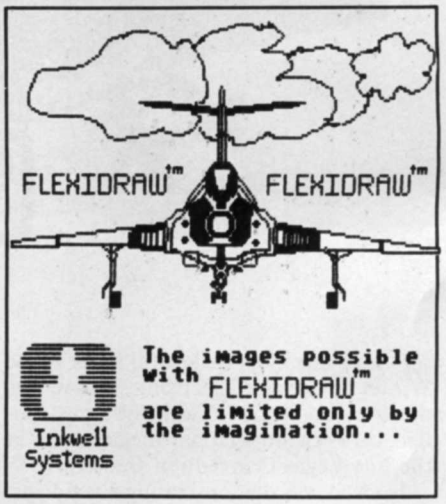
• *Crosshairs:* Places a set of full-screen crosshairs on the screen. Makes for easy positioning of the cursor relative to images which may not be near the working area.

• *Average:* Cuts down on "jitter-hand" look of pen lines by averaging pen location during movement. This feature is very useful in creating smooth curves and arcs.

• *Alpha:* Allows text to be printed on-screen next to hi-res graphics.

• *Print:* Prints work area on a printer. Commodore 1525, Gemini-10, C. Itoh Prowriter, and Okidata Microline series are directly supported. Many other graphics printers will also work, if interfaced compatibly.

The Flexidraw system also makes use of keyboard commands, including the special function keys. A template that fits over the function keys is supplied with the package to prompt their use.



Of course, work area files can be saved and retrieved from disk. Graphics file reads and writes are acceptably quick.

Inkwell Systems has announced a new software package for release soon. It will allow color and pattern fills to be generated on Flexidraw files. This module will lift the system out of the realm of monochrome and into the realm of living color.

Included in the documentation are tips for accessing the pen from Basic, and included on the program disk are sample Basic programs that use the pen as an input peripheral in menu and music programs. Latching into the pen from Basic is pretty straightforward, and the potential of the peripheral should be of interest to hobbyists.

For $150, the Flexidraw lightpen system for the Commodore 64 is a good value. If you are interested in hand-creating art on the C-64, the system merits serious consideration. Look for an evaluation of new Inkwell Penware in upcoming editions of Commodore's Port. END

CIRCLE 444 ON READER SERVICE CARD

SUMMER GAMES.
WHY WATCH THE OLYMPICS WHEN YOU CAN BE IN THEM?

You're an Olympic athlete competing in eight key events at the Summer Games. How well can you score in track, swimming, diving, shooting, gymnastics and more? So realistic, there's even an opening ceremony and awards presentation after each event.

Unlike other "Olympics-Like" games, Summer Games has incredible realism, superb state-of-the-art graphics and sound effects (including national anthems from 18 countries), and it is a true action-strategy game. In each event you must plan and execute your game strategy in order to maximize your score. It is not just a matter of how fast you can move the joystick.

So change into your running shoes, grab your joystick and **GO FOR THE GOLD!**

One or more players; joystick controlled.

EPYX™ COMPUTER SOFTWARE

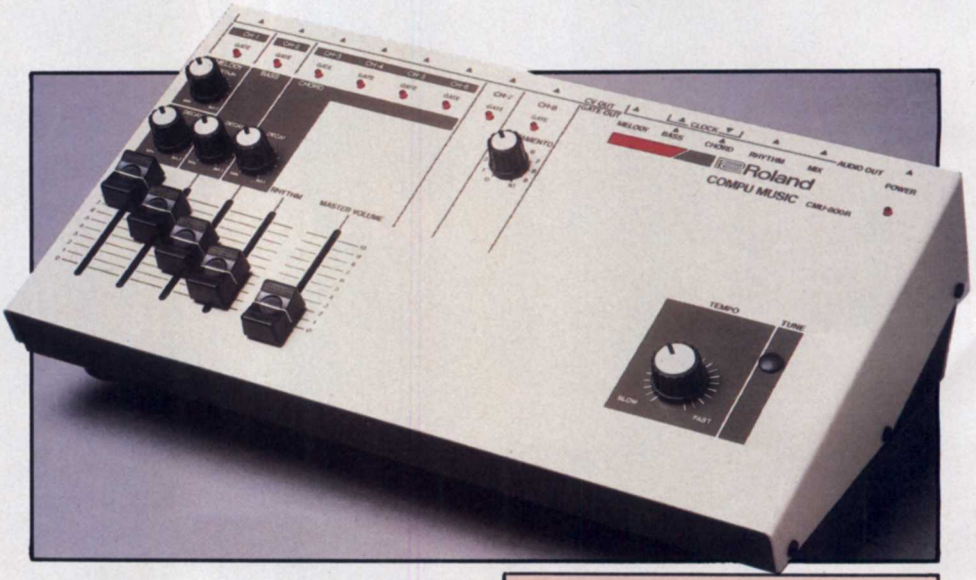
Strategy Games for the Action-Game Player

CIRCLE 127 ON READER SERVICE CARD

creative computing equipment evaluation

The Roland Compu-Music 800

John J. Anderson



Flip on the radio to any pop, rock, or contemporary classical music station, and you'll hear it. You may like it, you may hate it, but you can't deny it: electronics have changed the sound of music.

It started with the advent of the electric guitar back in the 1950's. A lot of sneering went on. But rock and roll was born. Then the Moog synthesizer showed up in the late '60s. More sneering occurred. But so did *Switched-On Bach*.

In the 1970's, a new crop of multivoice sound synthesizers gained acceptance by the mainstream of pop, rock, and new wave sound. Sneer if you dare. And by the onset of the 80's, inexpensive computerized musical instruments had brought a new musical possibility to Joe Consumer: the idea of making his own music.

And as far as we are concerned, that is a major transition brought about by microprocessor technology. It has to a degree made obsolete *passive* entertainment, in favor of the *interactive* variety. You may *become* the rock star (or for that matter quarterback, artist, detective, race car driver, spy), instead of remaining a mere spectator. In short, you may be the programmer rather than the programmed.

Blinded Me With Science

Music machines now retailing for $500 and less can make Joe Consumer sound like Joe Jackson. As an alternative to listening to the radio, spinning a record, or watching MTV, you may opt to create your own noise—and make that noise sound pretty darned good. Preset drum patterns can help keep you on tempo. Automatic chord memories can provide the backup. LED indicators can tell you which melody keys to press. And if you need more help, some machines will read bar-coded scores directly into memory, for playback with or without your lead.

Now let's say you already know all this, and have an Apple computer. You may take the reverse approach: adding a musical instrument to your computer. This potential has been around for a while. There are the Mountain Music System, the Alf, the Soundchaser, alpha Syntauri, and about a half dozen other music peripherals. And now there is a new contender from the makers of one of the most popular lines of professional synthesizers around: Roland.

Band In A Box

We wish you could play this magazine, to hear the Compu-Music 800 in action. Five hundred dollars is a small price to pay for your own band. The technical description up ahead does little to convey how good the unit sounds. With it, you have the basis of unlimited sound production of a quality that a short while ago would have required a small recording studio. If you already have a multitrack tape deck that allows recording of one channel during playback of another, all you need is a mike and a CMU-800, and you will *have* a small recording studio. If that is the kind of thought that excites you, do read on.

As opposed to other hardware that has come before, the CMU-800 is a self-contained stand-alone synthesizer that inter-

creative computing HARDWARE PROFILE

Product: Roland Compu-Music 800

Type: Music synthesizer

System: Apple II, II+, IIe

Format: Disk

Specifications: Six-voice, nine octave synthesizer with seven-voice drum synthesis.

Performance: Excellent — superior to other Apple systems at twice the price.

Ease of Use: Fair. New software could improve this rating.

Documentation: A bit skimpy, but adequate.

Price: $495

Summary: A fantasic toy for amateurs; capable of making a professional sound. Like having your own band in a box.

Overall Mark: Very good.

Manufacturer:
RolandCorp U.S.
2401 Saybrook Ave.
Los Angeles, CA 90040
(213) 685-5141

System Saver® didn't become the Apple's number one selling* peripheral by being just a fan.

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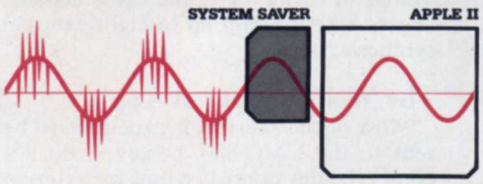
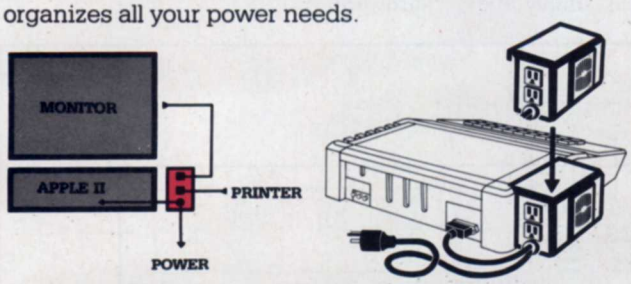


System Saver makes your Apple more convenient to use.

No more reaching around to the back of your Apple to turn it on. No more fumbling for outlets and cords to plug in your monitor and printer. System Saver organizes all your power needs.

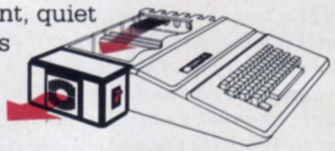


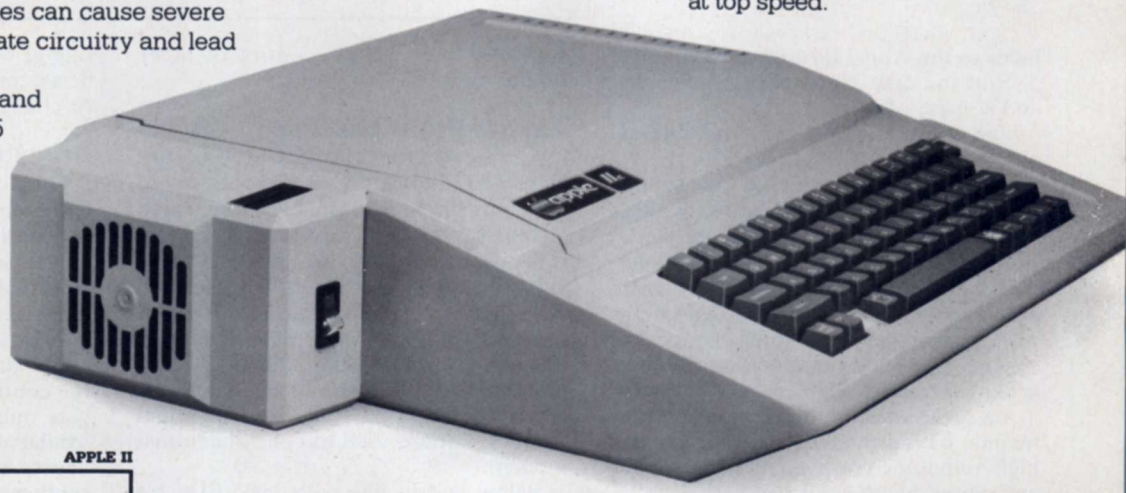
It functions as a multi-outlet power strip with two switched outlets. Plus System Saver offers the ultimate convenience; a front mounted power switch for fingertip control of your entire system.

System Saver lets your Apple keep its cool.

Today's advanced peripheral cards generate heat. In addition, the cards block any natural air flow through the Apple IIe creating high temperature conditions that shorten the life of the Apple and peripheral cards.

System Saver's efficient, quiet fan draws fresh air across the mother board, over the power supply and out the side ventilation slots. It leaves your Apple cool, calm and running at top speed.





So if you want to keep damaging heat, line noise and power surges out of your system for good, pick up the only peripheral that's in use every second your computer is in use. The System Saver. You'll soon come to think of it as the piece Apple forgot.

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*Softsel Computer Products Hot List. **PC Magazine: March 1983.

System Saver is UL Listed. System Saver's surge suppression circuitry conforms to IEEE specification 507 1980, Category A. Available in 220/240 Volts, 50/60 Hz.

System Saver is a registered trademark of Kensington Microware Ltd.
© 1983 Kensington Microware Ltd. System Saver is patent pending.

CIRCLE 170 ON READER SERVICE CARD

1) LED indicators
2) decay controls
3) audio output mix:
   A - melody channel
   B - bass channel
   C - chord channel
   D - drum channel
   E - master volume
4) portamento knob
5) tempo knob
6) tuner plug

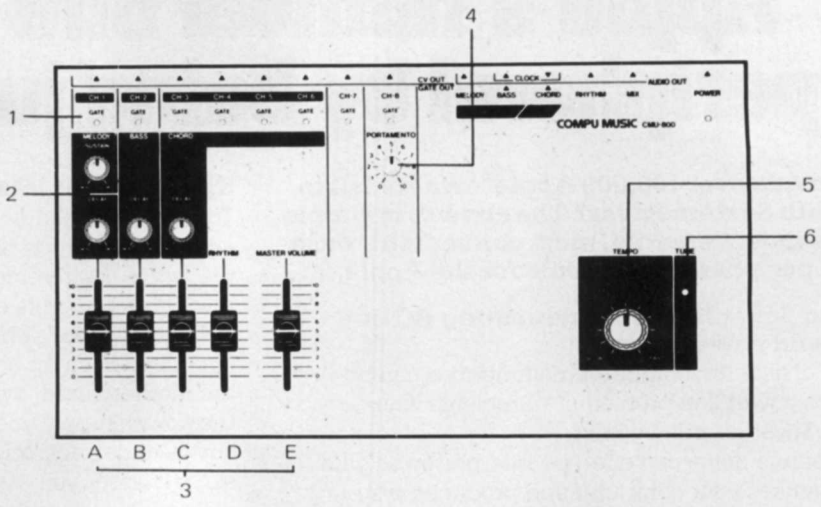

Figure 1. The top of the Compu-Music 800 includes a mixer for the band in the box. Linear controls make setting channel output volumes precise and easy. LED's above each channel control indicate which are currently being used. Tempo knob, on far right, can be adjusted on the fly.

faces to the Apple through a card in slot 5. Run the disk accompanying the unit, and you are off.

The unit consists of six internal components:

• A six-voice, nine-octave tone synthesizer. Although the envelopes for these voices are predefined, sustain and decay rates are variable on the melody voice, and decay rates of bass and chord voices are variable. The portamento (smoothing of tempo or volume output changes) of channel 8, which controls an external input, is hardware controllable.

• A seven-voice drum synthesizer. These include bass drum, snare drum, low and high tom-tom, crash cymbal, and open and closed hi-hat cymbal.

• A clock for controlling tempo. Rate is widely variable via potentiometer or by software settings.

• A mixer for controlling final output levels. Master output volume is continuously variable, as well are individual melody, bass, chord, and rhythm channel volume, by slide potentiometers.

•Eight control outputs for external synthesis. The Compu-Music is a self-contained polyphonic synthesizer, but it can also be the center of an expandable digital-to-analogue interface for control of other synthesizers.

Take It From The Top

Across the top of the CMU-800 are eight LED indicators, corresponding to the eight simultaneously available sound channels (refer to Figure 1). Channel one is the melody channel, two the bass channel, with a sound very much like an electric bass guitar. Channel three is the chord channel, piping voice channels three through six, which are individually programmed, for output as chords. Channels seven and eight have no internal sound sources, but are used to control external inputs.

Below and in line with the LEDs are separate decay controls for melody, bass, and chord channels. These control the amount of time it takes for a note to fade away after it sounds—like holding down a piano key after it is struck. In addition, the melody channel has a sustain control that allows for a slightly longer held ring. This helps the definition of the melody line. Below and in line with these are the slide controls for output volume.

On the righthand side of the unit is the tempo knob. The tempo is simply the rate at which music is played, and it can be set any way for any piece. It can even be changed while music is playing.

Bringing Up The Rear

On the rear of the unit are varied input and output jacks (refer to Figure 2). These include a mix output for all audio channels, and separate outputs for rhythm, chord, bass, and melody. A pulse signal from the internal clock oscillator is available from the clock/out jack, and an external clock pulse can be attached using clock/in. For the control of external synthesizers, eight gate pulse, and control voltage jacks are available. Using these, the CMU-800 can access and program up to eight external synthesizers.

The Well-Tempered Apple

Most of the musical instructions to be sent to the CMU-800, however, do not come via the control panel or external patch connection. Enter the Apple II, II+, or IIe with disk drive. The Apple software supplied with the unit, while not the most elegant program we have ever seen, is relatively easy to use, and provides the ability to squeeze the most out of the hardware.

1) power switch
2) audio outputs:
   A) mix (all channels)
   B) rhythm
   C) chord
   D) bass
   E) melody
3) clock in/out
4) ribbon cable to computer
5) eight gates for connection to external synthesizers

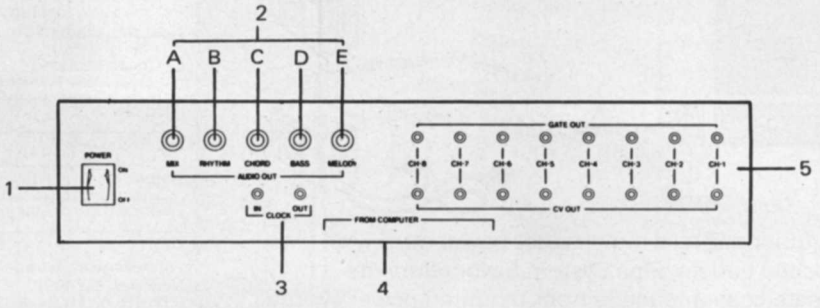

Figure 2.

THE PICK OF THE CROP

Reston Computer Group

A Prentice-Hall Company
11480 Sunset Hills Rd.
Reston, VA 22090

If you own an Apple computer, here are three of the freshest, juciest new titles to pick for your library.

THE GUIDE TO APPLEWRITER II, by G. Alex Ayres and John A. Allen, makes this word-processing program as simple to learn as it is easy to use. Using step-by-step examples and 75 illustrations, it explains the editor and shows first-time users how to do everything from entering and editing text to printing letter-perfect documents.

VISICALC™ EXTENSIONS FOR THE APPLE II AND IIe, by Jack Grushcow, is an applications oriented guide that can help you extend and adapt Visicalc™ to your own needs. Because it focuses on customized printing and sorting extensions, data transfer between spreadsheets, and connecting spreadsheets to the outside world, it's a must for the serious Visicalc™ user.

THE COMPLEAT APPLE™ CP/M, by Steven Frankel, is the first comprehensive guide for Apple™ CP/M users. It provides in-depth comparisons between two CP/M 2.2 versions, the Microsoft Soft Card and the Micropro Star Card/Applicard. It also examines the Digital Research ALS card utilizing CP/M, and reviews the performance of over 40 software programs.

Visit your local book store or computer retailer and pick the title that's ripe for you. Or pick a bunch, from Reston.

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A2 Controller Card	$ 100	$ 79
* A40, 160K, Drive	$ 449	$ 299
* A70, 286K, Drive	$ 599	$ 299
A40 A70 Controller	$ 100	$ 79
1/2 HIGH DRIVES ALPS, A40, Belt Drive, 163K	$ 299	$ 199
TEAC, T40, Direct Drive, 163K	$ 349	$ 239
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Rana Elite 1, 163K, 40 Track	$ 379	$ 259
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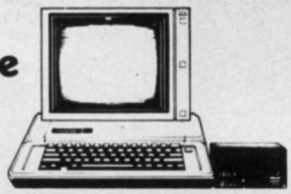

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Joystick (II+)	$ 60	$ 45
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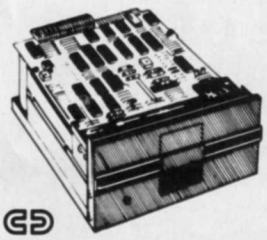

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Once the program is booted, the main command menu appears. This allows you to load, clear, save, verify, or edit music files. An added and extremely flexible feature allows you to transpose the key of an entire piece by half-tones up to two octaves in either direction.

Loading a pre-existing music file is as simple as typing L on the main menu screen. The program will then prompt you for a filename, which always uses the extender .CMU to distinguish it from other sorts of files. When the main menu returns, the file has been loaded. After hooking up to an external amplifier, press P, and you'll hear the tune. You can stop it and start it wherever you like, or play it continuously.

To begin creating your own sound, you enter the editor. The editor considers only one sound channel at a time, and allows you to see exactly how each is programmed. By typing E while listening to a piece, you can go in and edit at the point of the last note heard. Through the editor, you enter the codes that correspond to the musical values you desire.

Carrying The Tune

This is where things start to get a bit sticky, but compared to other systems we have seen, Compu-Music does pretty well. Each note entered is automatically given a value by the computer, called its "step number." As in traditional musical notation, data are divided into measures. While it is not essential for the computer to delineate measures, it is certainly essential for you—to keep timing organized across all channels. As the end of each measure is indicated, the computer automatically advances to the next. Then when problems arise, they can be clearly pinpointed and corrected measure by measure.

For pitches to be entered into the CMU-800, they must first be translated into numbers the computer will understand. Unfortunately, the current release of Compu-Music software, like most Apple products that have come before, requires "wet" memory for this task. This means you do the translation with your brain. (For an alternative approach, see the review of *Music Construction Set* in an upcoming issue.)

Don't get the wrong idea—it is not all that tough. Each note of the scale is represented by a number. The lowest C is 0, C sharp is 1, D is 2, and so on to 112. Because there are twelve notes in an octave, the first C above the bottom is 12, the second 24, ad nauseum. According to the documentation, "it is a good idea to just memorize the CV (control voltage) values." Not bloody likely. Here at the lab, our brain buffers are already too full of deadline dates, point spreads, phone numbers, and cryptic command codes to allow other machines to demand that kind of an effort.

```
PATTERN  STEP     B S L H Y O C     ST
      1     1 : X . . . . . .       6
            2 : . . . . . . .       6
            3 : . . . . . . .       6
            4 : . . . . . . .       6
            5 : X . . . . . .       6
            6 : . . . . . . .       6
            7 : . . . . . . .       6
            8 : . . . . . . .       6
            9 : X . . . . . .       6
           10 : . . . . . . .       6
           11 : . . . . . . .       6
           12 : . . . . . . .       6
           13 : X . . . . . .       6
           14 : . . . . . . .       6
           15 : . . . . . . .       6
           16 : . . . . . . .       6
                    * TOTAL ST=    96
```

Figure 3.

```
PATTERN  STEP     B S L H Y O C     ST
      2     1 : X . . . . . .      24
            2 : . X . . . . .      24
            3 : . X . . . . .      24
            4 : . . . . . . .       0
            5 : . . . . . . .       0
            6 : . . . . . . .       0
            7 : . . . . . . .       0
            8 : . . . . . . .       0
            9 : . . . . . . .       0
           10 : . . . . . . .       0
           11 : . . . . . . .       0
           12 : . . . . . . .       0
           13 : . . . . . . .       0
           14 : . . . . . . .       0
           15 : . . . . . . .       0
           16 : . . . . . . .       0
                    * TOTAL ST=    72
```

Figure 4.

Luckily, the appendix provides a complete chart of values.

Note durations are also represented by numbers, called "step times." This range must be between 1 and 255. The number that is chosen to represent a quarter note is called the "time base." A time base of 24 is highly recommended, as it is evenly divisible by three or four. This makes eighth, sixteenth, and thirty-secondth notes, as well as triplets, easy to effect.

In electronic music, and the CMU-800, the articulation of a specific note is called the "gate time," and is also represented by a numerical value (in this case between 0 and 255). This corresponds to the length of time the "keys" are held down. It functions relative to step time; gate time may never exceed step time for a single note. However, a note with a relatively long step time and a relatively short gate time will sound staccato during articulation. If the gate time is set to zero, you have created a rest. According to the documentation, "gate time allows the computer to gain a sense of 'human expression' which would be sorely missed if it were not available."

Tonal music data for the Compu-Music consist, therefore, of lists of values across measures of pitch, step, and gate. Getting chunks of these to mean much to you from the editor does take a bit of practice. But because you can listen to whichever parts of the composition you want, zeroing in on problems is facilitated.

Beating The Drums

The percussion potential of the CMU-800 is one of its most attractive features. Using the seven-voice drum synthesizer, rhythm patterns of nearly any style and complexity can be attained. Though it might not fare so well with Bach, adding a rhythm channel to a pop- or rock-style composition really enhances its sound.

Rhythm patterns are set up in channel 0 and are then called into the score by channel 9. A pattern consists of a single measure, which is broken into 16 steps across the seven available percussion voices. To "hit" the bass drum, type an X under the B column in channel 0. An example is shown as Figure 3. This plays a bass drum quarter note on each beat of the measure; notice that the total step time for the pattern is 24. Using the keys A for left, S for right, W for up and Z for down in the editor, you can move the cursor around the pattern grid, putting in the percussion "hits" you desire. Typing a period over an X cancels it. Figure 4 shows a simple waltz pattern on the bass and snare. Each "hit" is a beat. Because the step time in the far right column has been set at zero after the first three rows or beats, they will be skipped entirely.

Rolls, flams, syncopation, and other percussion effects can be created easily using drum pattern grids. Most pieces will use a multiple rhythm "library," repeating old patterns and invoking new ones as desired.

Know Your Editor

The final hurdle in working with the Compu-Music unit is learning the shortcuts. The editor has been designed to eliminate busywork wherever possible (a partial list of commands appears as Figure 5). As with a word processor, musical data can be inserted, altered, or deleted without much effort. The copy function allows data to be copied without tedious retyping. If a phrase is to be repeated, the copy function makes it simple. When creating chord progressions, the copy function is indispensable. After ironing out the first channel for a chord, copy the lead chord data right into the next chord channel. Then change only the pitch data to finalize the second voice of the progression. This process can be repeated for the remainder of chord channels.

Symbiotic Synthesizers

The Compu-Music also has the ability to control up to eight voices of external synthesis through the outputs of its back panel. The only requirement for hook-up of an external synthesizer is that it accept control voltage inputs and be set at one volt per octave, which is standard. It is also possible to combine internal and

external voices for a much "fatter" sound.

Keyboard synthesizers from Roland and other sources can be controlled by an Apple through this means—and programmed in exactly the same way as the Compu-Music unit itself.

The Down Side

There aren't very many criticisms we can level at the CMU-800. The ones that do come to mind are softened by ear—as stated above, once you hear the potential of the machine, you just want to sit down and start working with it. Still, we can be picky: that is our job.

The software could be better. It wouldn't take all that much to do the translation from musical notation to numerical codes *inside* the Apple. This would make for a much friendlier device. According to Jeff Rona of Roland, work is underway on a new release of the driver software that will offer an improvement on that score. As it stands now, the Compu-Music is a much greater hardware than software achievement. But that is a much better situation to be in than the reverse, which is where many other Apple music peripherals stand—nice user interface, but short on the hardware side.

The documentation puts it well: "Unlike anything available before, the Compu-Music is an open-ended system. Other electronic instruments...cannot be changed without expensive modification or replacement...With Compu-Music, the hardware is just the beginning. It is only half the system. New software can be created for various applications to allow the system to continually grow."

It is rather unfortunate that the waveform envelopes are preset for all voices. Perhaps this is too much to hope for the price, but it would have made the Compu-Music a much more attractive system. The Compu-Music can, of course, be used with external signal processors to enhance its sound. The sound can be modified with equalizers, flangers, phasers, echos, reverbs, filters, wah-wahs, delays; you name it. The full mix can be modified, as can individual channels.

Not to say that the preset envelopes are not acceptable. They are really quite nice, as is plain vanilla ice cream. Wouldn't it have been fantastic, though, if just a few voice effects were available from within the unit itself?

The potential is there for a fatal screw-up right out of the box.

The documentation leaves a bit to be desired. It is short, sketchy, rife with typos, incompletely glossaried, and totally unindexed. It could have done with more examples and has the feel of something hastily translated from a non-Indo-European tongue. Still, enough information does appear in it to get you going.

Bozos Beware

A caveat. Whatever you do, make sure you plug the interface card for the unit in correctly. In what we see as an unfortunate decision, the connector card for the CMU-800 has the same Apple-slot-style edge connector on both ends. Despite the fact that the card is well labeled, and the component side would have to do an about face, this raises the ugly possibility of hooking up backwards. As Murphy's Law applies nowhere more religiously than here at the lab, a former editor who shall remain nameless did just that, blowing out our initial review unit in the process. (As we heard at CES after the incident, the mere mention of this nameless editor's name at Roland induces seizures.)

So, if you are as dumb as we are, be extra careful. The potential is there for a fatal screw-up right out of the box.

On the dream list, a real-time keyboard peripheral à la Soundchaser would bring the Compu-Music into the major leagues. Admittedly, this would change the whole direction of the machine. For now, we'll be content jamming in real time on a Casio 401.

The Tag

Nit-picking aside, we rate the Roland Compu-Music at $500 as a next-generation breakthrough in microcomputer controlled music synthesis. Let me confirm it: some of you who have just read this now have found the system you have been waiting for. Roland has announced that interfaces to other popular micros will be available soon. So get out there and hear one! END

1. By typing the MEASURE and STEP number, the cursor can be moved to any point in the score.
2. [I] -- **INSERT**--Allows for inserting and adding data anywhere in the music.
3. [D] --**DELETE**--Allows for deleting any amount of data.
4. [C] or [.] **-COPY**--Data already entered can be copied and used anywhere in the piece without being retyped.
5. [M] **--MEASURE PLAY**--Plays only the measure the cursor is in. Allows for rapid error checks.
6. [P] **--POINT PLAY**--Plays the entire piece starting at the cursor point.
7. [=] **--SOUND EDIT**--Plays the pitches as they are entered.
8. [?] **-HELP**--Displays all the edit commands on the screen.
9. [F] **-FORWARD PAGE**--Moves the editor ahead one page.
10. [B] **-BACK PAGE**--Moves the editor backward one page.
11. [T] **-TRANSPOSE**-Allows for changing of CV bias (key) in any section of the music.
12. [esc] **-QUIT**-Leaves the section of the editor being used. Hitting the [esc] key also stops music if it is playing.
13. [<] [>] **-REPEAT**--Lets any block of notes be repeated multiple times.

Figure 5.

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CIRCLE 210 ON READER SERVICE CARD

creative computing equipment evaluation

The Keyport 717

Stephen Kimmel

As Winnie the Pooh might say "You never can tell about computer shows." Sometimes even the most obscure regional computer show will hold a startling new device or two. Tulsa, OK, for example, is not widely known as a hotbed of personal computers or peripherals. One display, however, seemed particularly noteworthy. On one side was a Lisa—looking lonely and forlorn. She was being ignored by the large crowd on the other side of the display. After playing with Lisa, I joined the mob. They were crowding around an old Apple II. The real attraction that was shutting down the Lisa wasn't the Apple II but the peripheral hooked to it. The Keyport 717.

A digression: one of the easy criteria you can use to judge the ease of use of a personal computer is number of keys.

The Polytel people started sweating when I asked if I could stand on the thing.

Generally, the more keys the better. My typewriter has 54 keys. That would be barely adequate for a computer. My computer has 77 keys. The TRS-80 Model 12 has 82.

One glance at the Keyport 717 tells you exactly what it is and how you use it. It also tells you that the number of keys discussion is now over. The crowd pleaser at the Tulsa computer show was operating an Apple II with a customized *VisiCalc* keyboard with 286 "keys."

The Keyport 717 is a fully user programmable flat membrane keyboard that measures 11″ by 24″ and has 717 small pressure switches available to use as keys. The basic unit sells for $179.95 with a utility disk and two user overlays and Basic overlay. (You could hook the unit to almost any computer right now but only the Apple has the software driver.) The applications packages consist of a specialized software driver and a printed overlay sheet that sits on top of the Keyport 717. It also comes with a 2″ x 12″ x 25″ case that can be used to carry the various overlays and disks.

Indestructible

Like most membrane keyboards, the Keyport 717 is impervious to liquids (coffee, soda pop, jelly, etc.) and is virtually indestructible. The Polytel people started sweating when I asked if I could stand on the thing, and they looked more than a little nervous when I started jabbing it with my pencil. The keyboard survived both tests, though they aren't recommended. You could, theoretically, poke a hole in the plastic covering. Since the keyboard has no electronics or moving parts, about the only way to damage the thing is to short it out by creasing it or poking holes in it.

Oh. Didn't I tell you how thick it is? My apologies. The Keyport 717, without the carrying case, is about $1/16$th of an inch thick. Placed on your desktop, it is no thicker than a blotter. It can also be used up to 200 feet away from the com-

creative computing

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CIRCLE 192 ON READER SERVICE CARD

puter it is driving. To help you visualize that, pick a starting point at the end of a very long corridor or sidewalk. Take 100 steps. Turn around and look at where you started. That's where the computer is while you are handling the Keyport 717. Two questions instantly come to mind. Who could read an 80-column display at that range? Who would want to? Obviously, the practical result of this is that you can run the ribbon cable any way that is convenient and still have plenty of latitude about where you put the computer and keyboard.

The child doesn't hit the cow button or type the word cow; he simply touches the cow.

Consider some of the possibilities. Suppose you are a teacher with a single computer and classroom full of kids. You are trying to demonstrate something on the Apple. You could type on the keyboard blocking the student's view, or you could stand at the back of the room and press a single key on the Keyport 717. You could then pass the keyboard around the room to let all the students have a turn.

Or suppose that you are a busy businessman and you don't want to take up a lot of room on your desk with a computer. You take the Keyport 717 and make it part of your blotter and mount the computer some place safe and secure.

Or how about security applications? The Keyport 717 is a cheap, waterproof remote terminal. Think about it. Where could you use an almost perfectly flat keyboard with an almost infinite number of fully programmable keys? How about a kid-proof keyboard?

Applications

There are three application overlay/programs. Each of these consists of a program and a database to drive the keyboard and a printed sheet of plastic to set atop the Keyport 717. There is, for example, the Basic programming overlay which is easily the best looking of the three.

In addition to a conventional keyboard, this overlay has all of the Applesoft keywords and characters assigned to separate keys. Some of the keys look like keys. Others look like buttons. Still others look like computer chips. If you want to select the lo-res graphics color yellow, just press the yellow printed button. The Basic programming overlay is extremely nice and could easily cut your Basic programming time substantially.

The second application/overlay is a children's educational game called The Farm. Cute. The overlay does show some of the other possibilities for overlay design. Half of the overlay is a picture of a very busy farm. At the appropriate point in the game, the child doesn't hit the cow button or type the word cow; he simply touches the cow.

The third application package is my favorite. It is the *VisiCalc* overlay. All of the *VisiCalc* commands and control keys are there, each with its own key. There is also a set of programmable keys.

Let's see. We want to work on the Tyrone budget for 1983. Press Load Task 1, and a few seconds later I am working on the fate of a hundred workers at our Tyrone plant. Easy as that was, I found the Keyport 717 really shined when constructing the spreadsheet. My guess is that it cut my time by a third.

There are other applications packages in the works. Two of the more interesting are the *Apple Writer* package and the Apple Logo package. Think what you could do with 717 Keys on one of those. And you aren't limited to their applications packages. It is fairly easy to create your own applications.

Drawbacks

Of course, there are a few warts on even this exceptional product. Two come immediately to mind. The first is the classic complaint about membrane keyboards. It is utterly impossible to touch type on the Keyport 717. It did take me a while to get used to the Keyport 717. The feel is not like a typewriter keyboard, and there seems to be an unlimited number of choices. Each of the pressure switches is a discrete location, and for a while I missed the keys. That was quickly overcome. But then the Keyport 717 doesn't lock out the regular keyboard. When you want to type quickly, you can use the regular keyboard. If you want to rush through something else, use the Keyport 717.

How about a two-player game in which each player could have his own keyboard? Or a foreign language overlay printed in the foreign language; how about a Japanese keyboard?

The other complaint may be more serious. The Keyport 717 monitor and data table consume memory. The monitor takes nearly 2K while the data tables can take as much as 8K or about 11 keystrokes for each of the 717 programmable keys. For some applications this could easily be critical. Lives there a soul who has never run out of memory? Most Keyport 717 applications, though, use only 300 or so of the keys with about six strokes per key. That would mean a 4K loss of memory. A small price to pay for greatness.

How about making a target out of your Keyport 717? You could hang it on the wall and shoot dart guns at it. Or how about using it as the base for an animal behaviour experiment. You build the rat's maze on top of the Keyport 717 and let it send the data about where the rat is to the computer.

Installation And Documentation

The unit is a piece of cake to install. (If you have never installed cake in your personal computer, see the April 1964 issue of this magazine.) You just plug it into the game port.

There is also a software portion of the process. Each Keyport 717-computer pair must be calibrated once. When the initialization program prompts, you press a line of keys across the unit and another line the other way. The whole process takes about five minutes, and you never have to do it again. I have seen gummed labels that were harder to install.

The documentation and instructional manuals are clear and succinct. In a matter of minutes, I was well on my way to having all 717 keys respond with either *Creative Computing* or Stephen Kimmel.

Of course, that is not how you want to design a Keyport 717 overlay. You need to give careful thought to what functions you want to automate. Which ones do you want to group together? Where do you want to put them on the keyboard?

I have seen gummed labels that were harder to install.

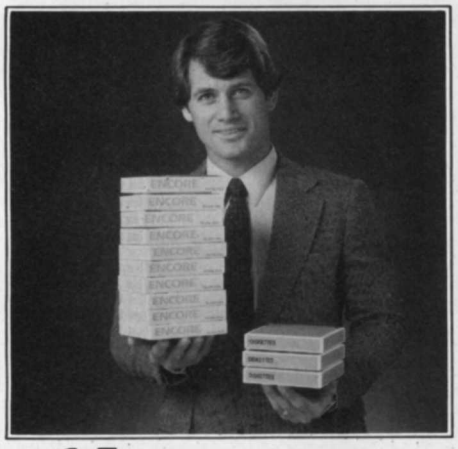
The manual contains a chapter on designing a Keyport application that is simple and easy to follow without being condescending.

How about a romantic novel writer with each key programmed for a different trite cliché? In minutes your cat could be Barbara Cartland. More seriously, a lawyer could program it to call up certain repetitive phrases at the press of a key.

I like the Keyport 717 very much. It is one of the finest Apple peripherals I have seen in a long time. And soon TRS-80, IBM, Commodore 64, and Atari owners will be able to buy them too. ■

CIRCLE 446 ON READER SERVICE CARD

Three good reasons to try Encore™ diskettes.



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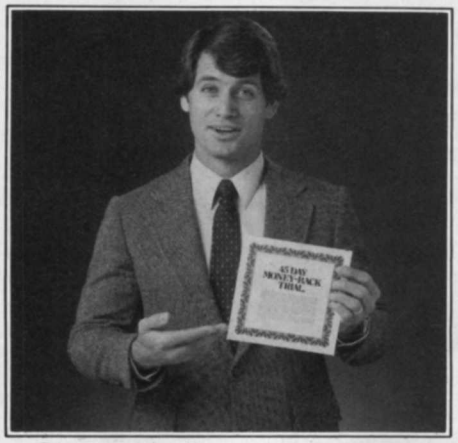

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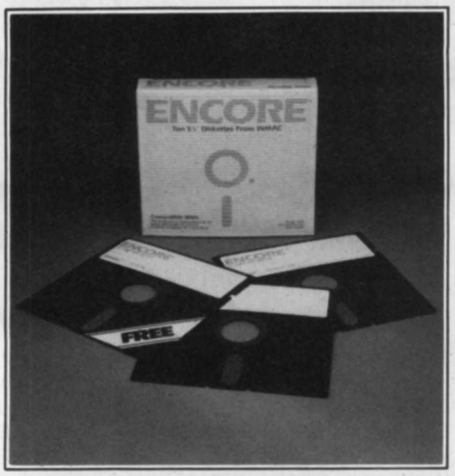

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creative computing software evaluation

Growing Up Literate

Part 6

Betsy Staples

Beware of swillware. There is still a great deal of it on the market. Although the quality of educational software is improving, we still have difficulty finding worthy programs to recommend in Growing Up Literate.

Furthermore, it is becoming more difficult to judge software by its cover. Several of the truly terrible packages we looked at this month were attractively packaged in colorful binders printed with lofty promises and descriptions of authors with impressive credentials. Often it is not until we have spent an hour or more with a package that its true nature becomes apparent and we realize that we have found another piece of...swillware.

The moral: don't assume that a program is educational just because it claims to be so, and don't buy a package unless you either test it yourself or have an unconditional guarantee of satisfaction from the dealer or manufacturer (or, of course, see it recommended in the pages of *Creative Computing*).

With the caveats out of the way, let's move on to packages for May.

Briar Rose

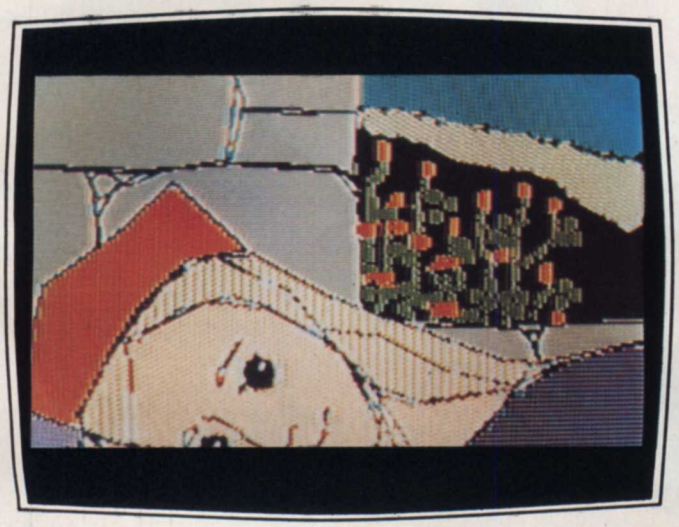
Briar Rose is a computerized version of the fairy tale many of us (including Walt Disney) know as Sleeping Beauty.

Fifty-five hi-res screens illustrate the story, which can be told in any of several ways. The easiest way is to choose one of the three "text levels" offered at the beginning of the game. Unfortunately, no definition of the text levels is provided, nor is any age range suggested for the program.

We assumed that Level 3 was for older children than Level 1, but we could find very little qualitative difference among the three versions of the story. For example, the caption for illustration number 16 in Level 1 is: "May I try to do it?" asked the princess. Under the same illustration, Level 2 reads "May I try it?" asked the princess, and Level 3 reverts to the wording of Level 1.

The documentation booklet says that you can also use the program illustrations to create your own story by combining the graphics in any order and typing in your own text as captions. We found changing the text relatively easy, but were unable to figure out how to change the order of the pictures. This unfortunate lack of documentation for a very useful feature diminishes the value of the program significantly.

The illustrations, which were created with *Graphics Magician*, are attractive and well drawn. They fill the screen relatively quickly, so there is little opportunity for the reader or readee to become bored. The story is faithful to the story of Sleeping Beauty as we remember it except for the addition of a mini-adventure game at the end.

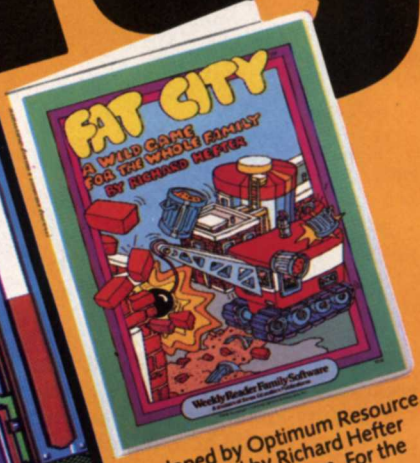


Briar Rose: Princess Sleeping.

Briar Rose: Tower.

Strategy-arcade game for the whole family!

Fat City

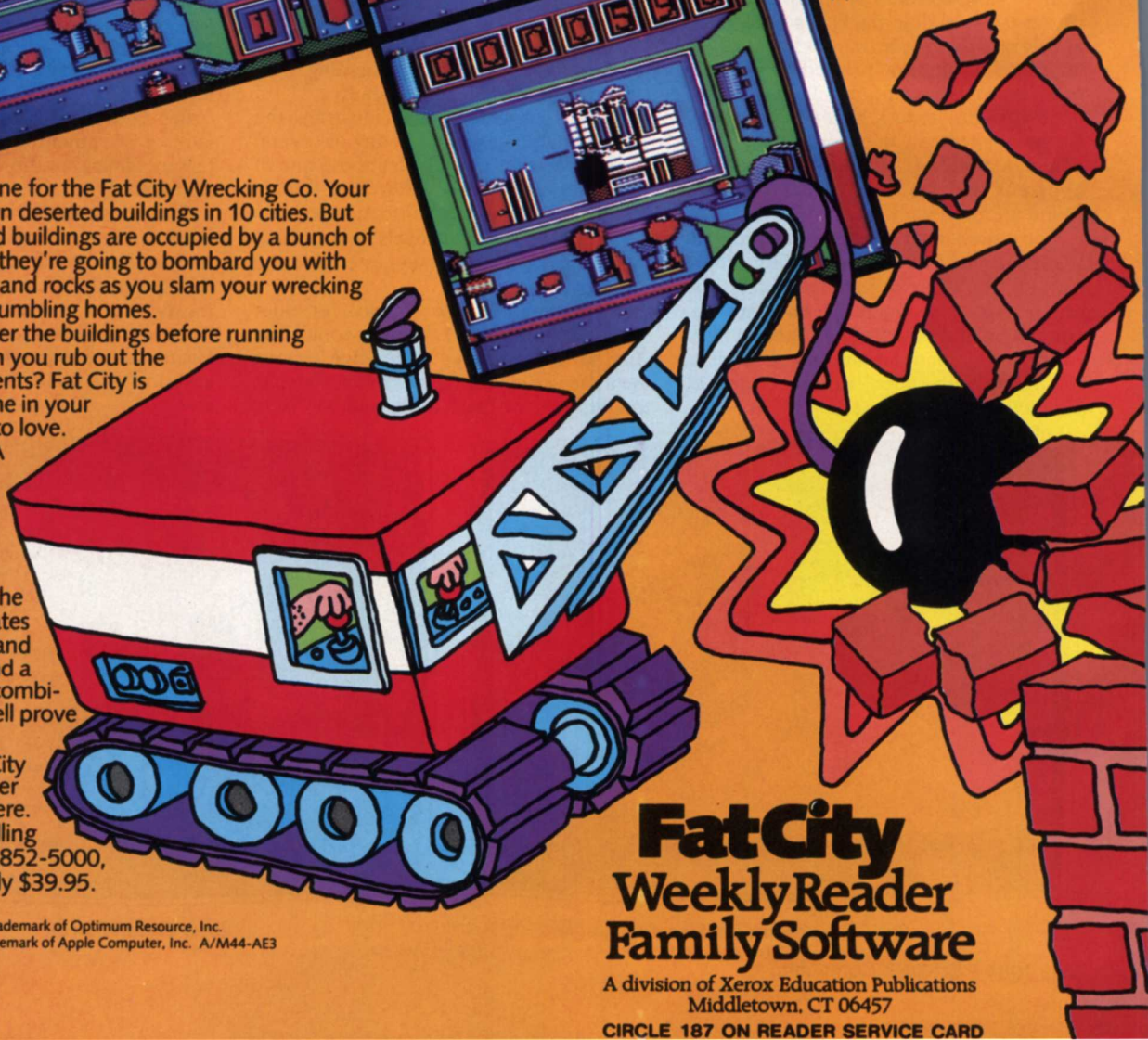


Developed by Optimum Resource, Inc. Designed by Richard Hefter and Steve Worthington. For the Apple computer.

You run a crane for the Fat City Wrecking Co. Your job: knock down deserted buildings in 10 cities. But beware! The old buildings are occupied by a bunch of nasty rats. And they're going to bombard you with cans, tomatoes and rocks as you slam your wrecking ball into their crumbling homes.

Can you batter the buildings before running out of fuel? Can you rub out the rampaging rodents? Fat City is a game everyone in your family is going to love. Says Softalk: "A great deal of thought went into its development as its excellent playability attests. The game incorporates super graphics and strategy, fun and a new idea. The combination could well prove addicting."

Look for Fat City in finer computer stores everywhere. Or, order by calling toll-free 1-800-852-5000, Dept. AE-3. Only $39.95.



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Fat City
Weekly Reader Family Software
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Middletown, CT 06457

CIRCLE 187 ON READER SERVICE CARD

When the prince goes to the castle to rescue the princess, you can choose to help him find her. This you do by choosing to go right or left at each of several doors, hallways, and staircases. The task is trivial, because the program allows you to go only two moves in the wrong direction before it sends you back to make the alternate decision. Our young playtesters found the game part of the story fun the first time or two, but we discovered that it grew old before the story did.

Documentation

The 12-page 8 1/2 x 11 documentation booklet could have added immensely to the value of the program had it included clear instructions for rearranging the graphics and further discussions of ways to use the package in the home and classroom. As it is, it falls far short of the mark. The appendix, which lists the record number, picture number, line number, and text associated with each picture is by far the most useful part of the manual.

We were distressed to find in the booklet two grammatical grossities: "If the user wishes..., they can" and "...to the point from which he or she just came from." How often can we implore the publishers of educational software to be especially careful with the editing of both on-screen text and printed documentation?

Summary

Briar Rose is a handsome graphics package which has potential for the creative young user. Unfortunately, the parent, teacher, or student is left to discover it for himself.

Richard Crandall of Blythe Valley Software told us that this program and others in the same series are in use in a number of schools in their special education programs—again, undocumented potential. We think this program is most appropriate for use in the classroom, but we wonder how many busy teachers have time to delve into the program and uncover its many applications. We urge Blythe Valley to consider augmenting the current documentation with suggested applications and educational objectives. With a complete manual, *Briar Rose* would be a very versatile package—and a bargain at $34.95.

CIRCLE 447 ON READER SERVICE CARD

creative computing

SOFTWARE PROFILE

Name: Briar Rose

Type: Story telling program

Authors: Susan Crandall and Thomas Halliday

System: Apple

Format: Disk

Summary: A lot of unrealized potential

Price: $34.95

Manufacturer:
Blythe Valley Software
40879 Highway 41
Silver Creek Center
P.O. Box 353
Oakhurst, CA 93644
(209) 683-4735

Four-Letter Words

Four-Letter Words, although it sounds more like an "adult" video game than an educational package, is actually an intriguing and educational lexical investigation. It comes in a no-nonsense white plastic three-ring binder with 50 pages of documentation, and by the time you finish playing with it, you should know a great deal more about four-letter words than you ever thought possible.

Four-Letter Words was originally designed to help foreign students learn English vocabulary.

The program offers two modes, Challenges and Search & Research. Let's look at Challenges first, since it is the mode with which most users will spend most of their time.

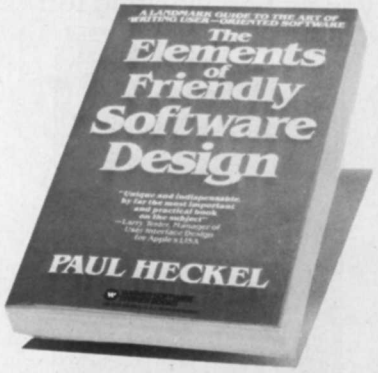
Challenges

The Challenges menu offers you a choice of four challenges or games. The first is Words from Words, which begins by asking you to enter a word or a vowel and three letters. You can also ask the computer to choose the word or letters for you.

On the next screen you see your word or letters and a report of the number of words that can be made from those letters. Your task is to find as many of those words as possible. Each time you enter a word, the program checks its dictionary, and if it finds your word, places it on the screen and gives you a point in the "right" column. If your word is not in its dictionary, you get a point in the "wrong" column. You can give up at any time by pressing ESC, and whether you end the round by giving up or by entering the requisite number of "qualifying" words, the program calculates a grade for you and displays it on the screen with an appropriate message.

The second challenge, Letters in Given Positions, asks you to enter two letters and two spaces in any order. Again, you can have the computer make the selection

Everyone From Commodore to IBM User Will Want This Remarkable Guide to Creating User-Oriented Software



Paul Heckel feels that to be "friendly," software should be visual, interactive, and above all, *communicative.* He first summons up the techniques of the great masters of communication in film, and of painters like Pablo Picasso and writers like Mark Twain. He then adds techniques of his own developed through years of successful software design, including programs for the Craig Language Translator and the all-new Viewdex™ system for the Epson HX-20. The result is a free-wheeling guide that is as delightful and surprising to read as it is easy and practical to use.

The Elements of Friendly Software Design explains:

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- How filmmakers' communication techniques can be used to make software design "friendly"
- Visual thinking as a key to design
- Planing for prototyping and revision
- Factors that determine user acceptance
- Examples of excellence—why VisiCalc is so successful
- Seven traps that snag even the most experienced designers

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The Creative Atari, edited by David Small, Sandy Small and George Blank. 8½" x 11", softcover, illustrated. $15.95.

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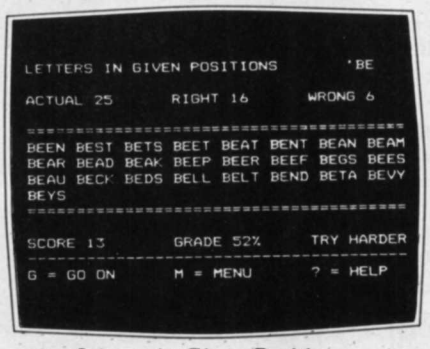


Letters in Given Positions.

for you. Game play is very similar to Words from Words, except that you are trying to find all the words that have the same letters in the same positions as your target combination.

In Letters in Any Position, you choose three or four letters and then try to find all the words that can be made from them. If you choose only three letters, the fourth letter in each word can be any letter in the alphabet.

The final challenge, Statistics, is one of the most unusual word games we have seen. It asks questions about the number of words that fit specified criteria. For example, How many words are there with O in the first position and G in the second position?

Our only significant disappointment with this program occurred when we read the multiple choice answers to the Statistics questions. We saw the following listed as possible answers: less than 3, 3 thru 4, more than 4. How, we wondered, could the author of a superb educational package like *Four-Letter Words* allow one of the most common grammatical grossities of the late Twentieth Century to slither onto the computer screen? Has he been watching too many beer commercials touting "less calories"? The abbreviated spelling of "through," while sloppy, is, perhaps, permissible in a program about four-letter words.

creative computing
SOFTWARE PROFILE

Name: Four-Letter Words

Type: Educational word game

Author: Robert G. Luster

System: Apple

Format: Disk

Summary: The definitive computerized work on four-letter words

Price: $55

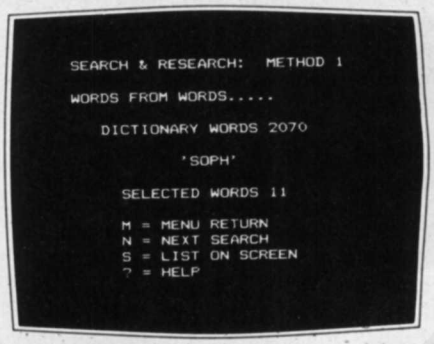
Manufacturer:
Conduit
P.O. Box 388
Iowa City, IA 52244
(319) 353-5789

Search & Research

The Search & Research mode allows you to search the program dictionary for the words which fit a given set of criteria in a straightforward manner, eliminating the gameplaying aspects of the Challenges. You can use any of the formats offered in Challenges as skeletons for your criteria.

For example, you can discover that using the rules for *Words from Words*, there are 11 four-letter words that use the letters SOPH. Then you can have them listed either on the screen or by a printer.

The disk comes with two dictionaries. The one that loads automatically when you boot the disk contains more than 2000 words; the one that must be loaded



Search & Research.

by the player contains more than 3000 words. The latter includes many words that the author considers "uncommon."

You can add and delete words by following the directions in the instruction manual.

Documentation

The manual is typewritten and double-spaced on 5 1/2 x 8" pages. It is neat, legible, and, although laced with occasional traces of educatorese, easy to understand. The separate Instructor's Guide section of the manual contains examples of the various Challenges and discussions of the limitations of each.

Also included is a section on "Educational Usage Scenarios" which are basically suggestions for activities using the program.

Summary

Four-Letter Words was originally designed to help foreign students learn English vocabulary. But, as the documentation notes, "it can benefit anyone—from a youthful spelling bee hopeful to a graduate student with a Master's degree in English." It is the definitive computerized work on four-letter words.

If you like words or just feel the need to know them better, try *Four-Letter Words* from Conduit. It really is an adult pastime—although not the kind you might at first have thought.

CIRCLE 448 ON READER SERVICE CARD

M-ss-ng L-nks

M-ss-ng L-nks. Try pronouncing or even typing that. Fortunately, all you have to do here is read it. And all you have to do to play the game is fill in the blanks so that these and other words can be recognized and pronounced.

M-ss-ng L-nks is a simple game which is not necessarily an easy game. Your task is to complete a long quotation from which many of the letters have been removed. The program includes nine quotations from each of nine children's stories, among which are such classics as *The Wind in the Willows*, *Little House in the Big Woods*, and *The Lion, The Witch, and The Wardrobe*. At the beginning of each game you choose the book and the numbered quotation you want to decipher.

You also choose the format in which you want the quotation to appear. The

Format E—Prints only A, E, I, O, U, and Y.

format used for the title is the easiest one offered—only the vowels are omitted. Other formats print every other letter, the first letter in each word, every other word, only the vowels, the last letter of each word, the first word of each sentence, only blanks to where the letters belong, or nothing but the title and author.

You also specify the number of guesses—one to five for one player, three to 15 for two players—each player will get for each letter. When you exhaust the number of guesses to which you are entitled, the program fills the letter in for you. Your incorrect guesses for each letter are recorded at the bottom of the screen, and the program calculates a score for each round played.

Documentation

The Program Guide for *M-ss-ng L-nks* is a 14-page typeset black and white booklet. It contains detailed instructions for using the program on an Apple, Atari, IBM, or TRS-80 computer, and gives examples of each of the formats.

At the end of the Guide are suggestions for other ways to play the game—against the clock and without the computer—and "things to think about when you aren't playing *M-ss-ng L-nks*"—inventing your own shorthand and the words we omit when we speak.

The educational objectives listed in the Guide include: Strengthening "the inborn 'language sense' we all use in reading and conversation." Improving reading comprehension, spelling, vocabulary, and understanding of grammar, punctuation, and sentence structure. And familiarizing children with the ability of the computer "to organize and display printed messages in different ways." We think the program fulfills these goals admirably.

Summary

When we first looked at the program, we had our doubts. "How can this be educational?" we asked. But we were soon hooked on the challenge of filling in the quotations using harder and harder formats, and after a while we realized that we really did have to think carefully about spelling and syntax to be successful in the game.

We also like the simplicity of the game and the provision for increasing levels of difficulty. Although it is not really practical for players of different ages and levels of education to compete on the same quote, the versatility of the game makes it fun for just about every member of the family, whether they compete with others of similar skill, race against time, or just try to improve their own scores.

We like *M-ss-ng L-nks* and look forward to bringing you more reviews of Sunburst products on these pages. END

CIRCLE 449 ON READER SERVICE CARD

creative computing
SOFTWARE PROFILE

Name: M-ss-ng L-nks

Type: Educational word game

Suggested Age: 9 to adult

Authors: Judah Schwartz, Jon Kaplan, Harold Chomsky, Walter Koetke III

System: Apple, Atari, IBM, TRS-80

Format: Disk

Summary: Good fill-in-the-blanks program; very versatile

Price: $39.95

Manufacturer:
Sunburst Communications
39 Washington Ave.
Pleasantville, NY 10570
(800) 431-1934
(914) 769-5030

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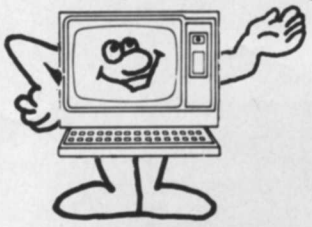

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Agent U.S.A. turns geography into an exciting race to save the nation from the ruthless Fuzzbomb. Along with learning geography, children hone their problem-solving and reasoning abilities.

Story Tree.™
Story Tree can bring out the Mark Twain in every child. Budding authors create their own mystery and adventure stories. A remarkable feature lets them weave alternate choices into every turn of the plot, and challenges their imaginations to the maximum.

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Scholastic™ Wizware

Spelldiver, Agent U.S.A. and Bannercatch designed and developed by Tom Snyder Productions, Inc. Story Tree designed and developed by George Brackett.

Spelldiver, Agent U.S.A. and Bannercatch available for Atari 800/1200/XL. Commodore, Apple and IBM versions available soon. Story Tree available for Apple.

CIRCLE 195 ON READER SERVICE CARD

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HELLO, COMPUTER: AN INTRODUCTION TO BASIC, by Lawrence P. Huelsman, can help both teen and adult beginners learn BASIC on many computers, including Atari™, using drills, programming problems, games, cartoons and an easy conversational style.

SURVIVAL ON PLANET X WITH THE ATARI™ HOME COMPUTER, by Orkin and Bogas, uses the exciting adventures of Vivian on Planet X to teach kids basic programming concepts and techniques. The fun is interspersed with short programs, illustrated by noted animator Bud Lucky.

ATARI™ LOGO ACTIVITIES, by Steve DeWitt, provides over 150 activities which encourage young and old alike to be inventive and creative when using Atari Logo™ educational language. The book includes five big projects and an in-depth discussion of Logo.™

ADVENTURES WITH THE ATARI™, by Jack Hardy, teaches you how to write adventure games in Atari PILOT™, Microsoft BASIC, and BASIC. It includes six actual adventure games to study, type in, and play, plus tips and techniques to help you create your own.

A+ PROGRAMMING IN ATARI™ BASIC, by John Reisinger, is a self-study workbook which gives you step-by-step instructions for BASIC programming on the Atari 400, 800, 600XL and 800XL™ computers. Stressing top-down programming in a fun and friendly manner, this book is perfect for school, workshop and computer camp.

If you want to make learning about Atari™ computers fun, then make Reston the teacher.

CIRCLE 162 ON READER SERVICE CARD

101 Ready-to-use business letters and a word processing package for good measure

creative computing software evaluation

Gold Letters and Gold Writer

David H. Ahl

Data Base Industries has released a set of 101 computer formatted business letters on floppy disk. Versions are available in CP/M, MS-DOS, and PC-DOS. The letters are furnished on a 5 1/4" or 8" disk, and a binder of all the letters with an index is included.

The disk contains the following assortment of letters:

8 credit collection
9 sales and marketing
13 customer relations
11 employee relations
8 credit terms
5 shareholder relations
4 community activity
4 media relations
7 services
11 personal businesss
12 internal memos
9 special situations

The letters are stored as ASCII files on the disk. Thus, a letter can be called up by nearly any word processing program. To do this, the word processing program is placed in drive A and the *Gold Letters* disk in drive B; the letter name is then called as you would call one that you had saved. Some word processing programs may require a special suffix on the end of the file name; this can be inserted easily from the operating system program name utility.

Some of the letters are practically ready to be sent out as is with just the addition of an inside address and signature line, while others require that information be inserted. Of course, all of them can be modified as much or little as you wish. For example, where a letter says "our company," you may well wish to put in your actual company name.

The flyer promoting the package claims that these letters will save time, improve company image, speed up collections, increase mailing response, promote new business, and allow you to respond promptly to all customer and prospect queries. By and large, this is all true. The letters are at least as well written as the majority that we receive from other companies. Moreover, having them ready to go should save a fair amount of response time.

While it is unlikely that a typical company will have need for all of the letters, certainly many of them will be useful; they can also serve as models for more appropriate, customized letters.

The letters are at least as well written as the majority that we receive from other companies.

What about the writing style? For the most part, the style is down to earth and practical. There is little flair or personality exhibited, but again, you can add your own. We were distressed to see several errors in grammar, for example ending the following sentence in a preposition: "I sincerely feel that you will be interested in seeing some of our products and items which your company could benefit from." There were also some awkward constructions, but few blatant errors.

We also do not like the Gold Letters style of closing a business letter with "Sincerely." We find "Sincerely yours," or "Very truly yours," more acceptable. The letters are all in the modified semi-block style. Good practice calls for one line to be skipped between paragraphs; however, most of these letters have two or three blank lines between paragraphs. Again, both of these items can be changed during editing, but we would rather have seen them adhere to standard convention as furnished.

Nevertheless, these are small nits to pick with this group of 101 letters, many of which are sure to be of use to practically any company, large or small.

Gold Writer

Just in case you do not already have a word processing package for your computer—or even if you do but would like to use the letters disk by itself (in a single drive system, maybe?)—*Gold Writer* is included on the disk. This package was developed by Executive Software, Inc. and was originally known as *Ready-Writer*.

Gold Writer is an easy-to-use and easy-to-learn word processng package with few frills but everything necessary for normal business correspondence and memos. As the manual says, *Gold Writer* is intended for occasional use and "contains the most-

creative computing
SOFTWARE PROFILE

Name: Gold Letters and Gold Writer

Type: Collection of business letters plus word processing

System: CP/M, MS-DOS, PC-DOS

Format: 5¼" or 8" disk

Summary: 101 Down-to-earth, practical letters and a no-frills, but complete word processing package.

Price: $159

Manufacturer:
Data Base Industries
330 W. Felicita Ave., Suite D6
Escondido, CA 92025
(619) 480-9616

used editing and printing features of *WordStar.*" Nevertheless, experienced *WordStar* users will appreciate the ability of *Gold Writer* to recover deleted text, automatically indent paragraphs, and move directly to a specified line number.

In addition to the 29-page manual, *Gold Writer* comes with two short tutorial programs, Learn 1 and 2, which guide you as you learn cursor movement and editing commands. The editing mode has 11 cursor movement commands, all activated by pressing a letter key while the control key is held down. These commands move the cursor in four directions, scroll the text, and move the cursor by pages. These commands can be executed in "quick mode" by first pressing Q. Then, for example, instead of moving up one line at a time, the cursor would move to the top of the screen.

Text can be saved and recovered in several ways. You can save and return to the text, menu, or operating system or quit without saving.

Printing is an easy process. However, unlike some other word processing programs, if you want other than the standard format, the formatting commands must be imbedded in the text file. These are known as dot commands, because a dot (or period) is the first thing on a line followed by the format command. These commands can be used to set page length, left margin, line length, header and footer lines, line spacing, page numbers and the like.

The included features ought to meet the needs of the majority of word processing users.

From the print menu, you specify only the file name, first and last page to be printed, and answers to four yes/no questions: disk file output, use form feed, suppress dot formats, and pause between pages (for single sheet printing).

Gold Writer has three toggles to turn on and off the insert mode, word wrap, and auto indent. Block commands provide the ability to mark, move, copy, delete, and save blocks of text or print format data. There is also a command to find a string of characters and replace it with another string selectively or on a global basis.

From this short description, you can see that *Gold Writer* is a capable package. It does not have subscripts, underlining, wild card searching, or single function keys. However, the included features ought to meet the needs of the majority of word processing users, not just the occasional user as promised in the documentation. Moreover, the price is right. In some sense, you might want to think of it as free since it is included in the $159 price of the *Gold Letters* disk.

A Gold Star

Data Base Industries gets our gold star for the *Gold Letters* and *Gold Writer* disk. Yes, the letters can be faulted on the basis of style, grammar, or personality. But it is easy to change them and store your own customized version. How long would it take you to get around to writing and saving 101 letters, or even 50 letters? Longer than 15 minutes each? If so, the $159 price of the Gold Letters disk is a bargain. And when you add in the *Gold Writer* word processing package, it is an exceptional value. So for this package, we award a gold star to DBI.

We understand that DBI will shortly have available a disk with 101 business contracts. Until we see it, we can't really pass judgment, except to say that we can't imagine that lawyers would be very happy about this, since there is not a lawyer in our acquaintance who thinks in anything less than 20-page contracts. END

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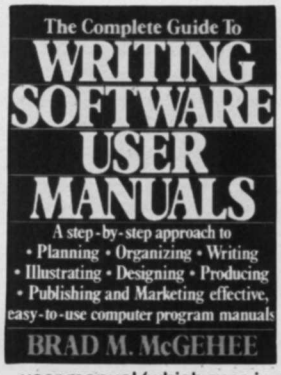

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by Brad M. McGehee

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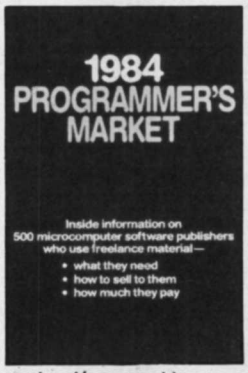

1984 Programmer's Market

Edited by Brad M. McGehee

Learn how and where to sell the software programs you write with this information-packed directory. *1984 Programmer's Market* puts you in touch with more than 500 software publishers and periodicals looking for freelance programs, with full details on contact names, addresses, types of programs wanted, submission requirements, contract/payment terms, sales tips, and availability of contract work. You'll also find articles on the inner workings of the software industry — how to write and sell game programs, prepare an effective software package, and copyright your work.

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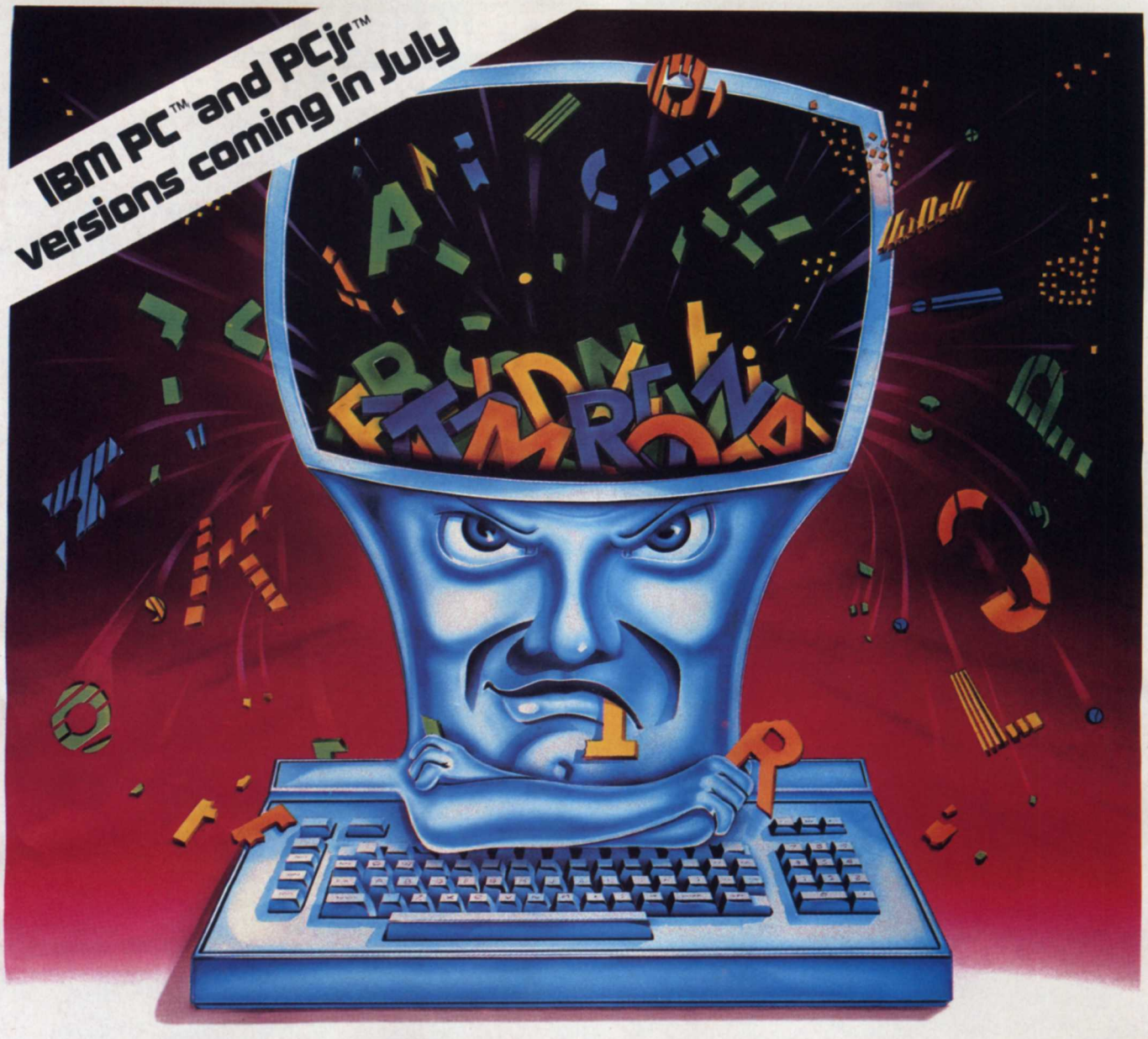

Does your word processor chop, slice, grind, shred, and purée?

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The Write Stuff™

The Ultimate Word Processor for Home and Office

For the Apple® II plus and IIe. One disk drive, 64K, DOS 3.3 required. $99.95 at computer stores, software retailers and bookstores, or call toll-free (800) 638-3030—in MD call collect (301) 824-7300

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CIRCLE 203 ON READER SERVICE CARD

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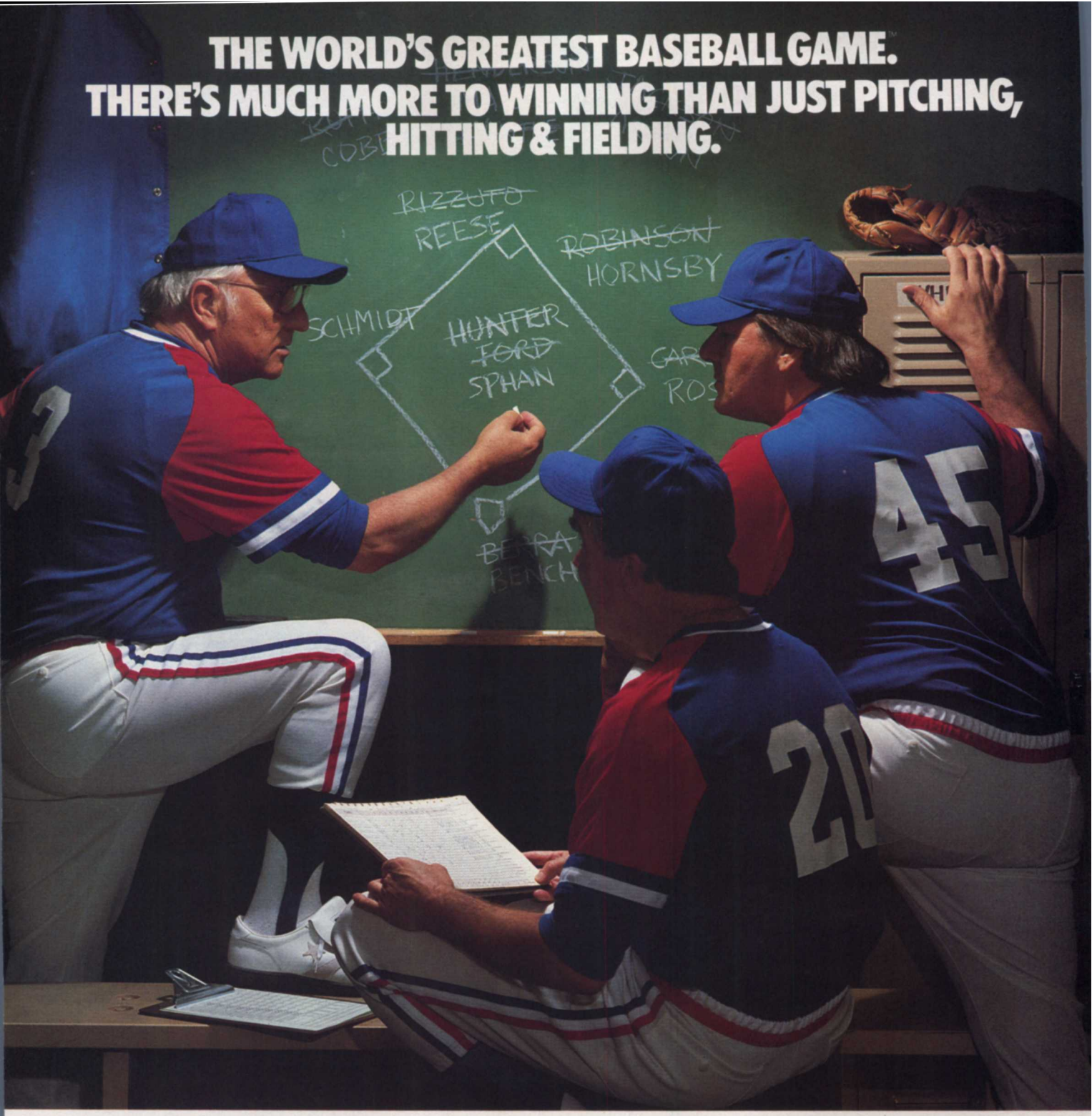

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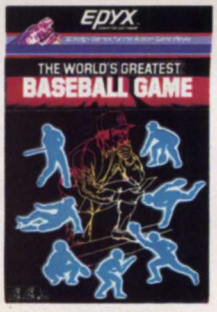
One or two players; joystick controlled.



EPYX™ COMPUTER SOFTWARE

Strategy Games for the Action-Game Player

CIRCLE 128 ON READER SERVICE CARD

Less Is More

Two Inexpensive Word Processors for the Apple

Steve Arrants

Minimalism is in these days. In art, science, and economics, less is more, and the less you have, the better. It may be a score by Philip Glass, performance art by Laurie Anderson, economy cars, or Reaganomics. What does this have to do with computers? In the past few months we have seen a new breed of software on the market. Inexpensive, accessible to every user, and increasingly potent in terms of sales and market share, such software exploits the potential of the microcomputer.

In word processing, for example, there is a trend away from the "more is everything" package toward software tailored to specific, well-defined applications. Why use *WordStar* for a letter to Mom?

The two packages reviewed below belong to this new group of word processors. *The Write Stuff* comes from Harper & Row, a firm noted for its trade and technical publishing. *Cut and Paste* is the newest offering from Electronic Arts, one of the most innovative software publishers in the industry. Can they duplicate the success they have had with games in the area of home software? Read on to find out how well these well known companies are doing with less is more.

The Write Stuff

The Write Stuff is a pleasant surprise in a field of near misses. It does what is expected of it without complicated commands or formatting codes, making it one of the easiest to use of the low cost word processors. This is a well thought out product that achieves the ideal of user-friendliness without forgetting to include useful features.

Documentation

The Write Stuff is packaged in a plastic box resembling a trade paperback. Two disks are included, a master and a back-up. The documentation is in the form of a booklet, which includes a five-lesson tutorial that covers all the commands contained in the program and uses numerous examples to show you how each feature of the program works.

Each chapter is well-organized into definite topics that gradually accustom you to using *The Write Stuff*. The authors assume no prior knowledge on your part. Every command and topic is painstakingly detailed with illustrations and examples.

Editing

Text entry is as simple as using a typewriter. *The Write Stuff* performs operations such as scrolling, insert and delete, cursor movement, and search and replace. To perform these operations you must leave the entry mode by pressing ESC to get to the EDIT mode.

Most of the commands are more or less mnemonic—CTRL-D for delete left, CTRL-R for delete right, CTRL-W for delete word. Scrolling is via the cursor keys, and the spacebar allows insertion before a word. Place the cursor on the first letter of the word where insertion is to begin. Tap the spacebar and begin typing text. Press the right arrow key to tell the computer that you have finished inserting text.

Underlining and boldface are achieved by using CTRL-Y for underlining and CTRL-B for boldface. To end boldface or underlining you enter a CTRL-N.

The Options Menu contains commands that you need when correcting or editing

creative computing

SOFTWARE PROFILE

Name: The Write Stuff

Type: Word Processor

System: Apple II+, IIe, Franklin Ace; 64K RAM

Format: Disk

Summary: Very easy to use. Great for home use.

Price: $99.95

Manufacturer:
Harper & Row Software
10 E. 53rd St.
New York, NY 10022

Comparison Chart

	The Write Stuff	Cut & Paste
Search		
find anywhere	x	
find in any direction		
find & replace	x	
find & replace 'x' times		
find & replace all		
wild cards		
Format		
show text as it will print	x	
width limit (screen)	80	80
from menu	x	
from within document	x	x
Printing		
justify	L,R	L
center	x	
phantom hyphen		
mult. columns		
super-/subscripts		
underline	x	
boldface	x	
prop. spacing		
print mult. docs. (spool)	x	
print mult. copies		
Files		
cont. back up	x	
auto back up on save	x	
save and cont. edit	x	x
insert other file		x
insert file portions		x
display other file		
display directory	x	x
Cursor Movement		
by character	x	x
by word	x	
by line	x	
by sentence		
by screen	x	x
to beginning/end of doc.	x	x
Delete		
by character	x	x
by word	x	
by line		
by sentence		
by screen		
delete & restore	x	
Insert		
typeover	x	x
push ahead	x	
cut & paste	x	x
Documentation		
tutorials	x	
examples	x	x
help menus	x	
reference manuals	x	x
reference card	x	x
Other		
price	$99.95	$49.95
back up	incl.	incl.
80 col card needed	no	no
menu driven	x	x
largest file size	5 pages	6 pages
protected disk	yes	yes
Comparative Ratings By Category		
ease of learning	2	1
ease of use	2	1
short document handling	1	1
long document handling	5	5
overall versatility	4	5

1 = easiest/most versatile, 5 = hardest/least versatile.

large blocks of text. ERASE, for example, lets you mark blocks of text for deletion. Place the cursor at the beginning of the text to be erased, use the right arrow key to mark the text, and press RETURN to finish. What if you have deleted too much or the wrong text? UNDO reverses the last command processed.

REPLACE is used to substitute characters, words, or phrases for any segment of your file. For example, if you discover that you have spelled a word incorrectly more than once or have used the wrong phrase throughout your file, the REPLACE command can be used to fix that word or phrase more than once. Use CTRL-A to put the cursor at the beginning of the file and press R to activate REPLACE. Position the cursor on the first occurrence of the mistake. Use the right arrow to paint the text and hit RETURN. Then enter the replacement text and a RETURN. You can replace some or all of the text at your discretion.

The Write Stuff gives you the option of designing the appearance of special sections without having to insert control codes.

The VIEW command lets you see how your files will look when they are printed out. Enter a V while in the Options mode or a CTRL-V in the Text Entry mode to see line spacing, margin size, underlined, and bold text.

Help

Help is available at any time by pressing CTRL-K on the II+ or Closed-Apple on the IIe. This displays the commands that are valid for the mode in use at that time. No complicated explanations are offered, so keep the user's manual by your side for the first few sessions. After a few hours of use, however, you should be familiar with all commands.

Printing

Printing a file involves two actions. First, you must set up a specific format for the text. The FORMAT command in the Options mode lets you control the way the page will look. *The Write Stuff* offers

At last, a letter-quality printer for tightwads.

And we don't mean a bargain-basement special, either.

Not by a long shot. The Abati LQ-20 is a top-quality printer, all the way. Offering quiet, bidirectional operation, an 18 characters per second printing speed, single sheet or optional continuous form tractor feed, and a full one-year warranty. All at a price even Ebenezer Scrooge would love.

And you'll love it, too.

Especially when you consider that the Abati LQ-20 is compatible with IBM, Apple, or any other microcomputer you might own.

Plus, it's incredibly easy to configure for word processors and spreadsheets, as well as most other software. And it's available in either serial or parallel formats.

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*Parallel model.

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*PC WORLD Magazine, July 1983

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all the standard options, including margin settings, right justification, print spooling, page length, line numbering, pause between pages, and page heading.

As you write, you find that different sections might look better formatted in a particular manner. For example, tables should be indented and centered, headings should be centered and underlined, and you might want to use italics for certain phrases. *The Write Stuff* gives you the option of designing the appearance of special sections without having to insert control codes. If you press ESC to get to the Options mode and F for Format, you are prompted for a format number. Format 0 is the printing format for an entire document. Formats 1 to 9 allow you to vary design features within the same file. These special formats let you use specific ASCII codes that your printer recognizes. After setting your formats, return to Options and hit P to print.

Utilities

The major function of the Utility section is to tell *The Write Stuff* about the requirements of your computer system. That is, you must tell *The Write Stuff* how many disk drives are connected, where the printer card is located, and if an 80-column card is present.

The Screen option lets you alter the way files will appear on the monitor. You can suppress the carriage return symbol, turn off key click, change the cursor, and change the display from normal to inverse.

Translate is very useful if you use another Apple word processor or a communications program. *The Write Stuff* saves files in a non-standard format. To use the binary or text files created by another word processor with *The Write Stuff*, you must convert them to *Write Stuff* files.

Cleanup is another useful utility. Whenever you delete a file and then save another one, DOS places it in the previously deleted filespace. For example, if you delete a 50-sector file and then save a 12-sector file, DOS reserves the entire 50 sectors for that file. Cleanup maximizes the number of files you can store on a disk by rearranging the files for efficient storage.

Summary

The Write Stuff is not for every application. It isn't very good with large files requiring complex print formatting, footnoting, or super/subscripts. If you need that ability you should consider a word processor such as *ScreenWriter II, AppleWriter*, or *WordStar*. For personal letters, school papers, and short documents, however, *The Write Stuff* is an excellent word processor. The documentation is well-written, and the program is reliable and very easy to use.

CIRCLE 451 ON READER SERVICE CARD

Cut and Paste

Electronic Arts has earned a reputation as the *Wunderkind* of software publishing. It is famous for excellent games such as *M.U.L.E.*, *Axis Assassin*, and *Hard Hat Mac*. *Cut and Paste* is their first entry into the area of personal productivity software. With so many successes, a failure is bound to occur sooner or later. After all, even the New York Islanders lose a few games. Electronic Arts, however, is on a winning streak. *Cut and Paste* lives up to the high standards we have come to expect from these software wizards.

Documentation

The user's manual is an incredible fourteen pages short. Within those pages you will learn all you will ever need to know about *Cut and Paste*. Instructions for editing, printing, formatting text, filing, and recovery from errors are contained in a concise little booklet. A command summary card is included, and frankly, that is about all you need to use this superb product.

creative computing

SOFTWARE PROFILE

Name: Cut and Paste

Type: Word Processor

System: Apple IIe; 64K RAM

Format: Disk

Summary: One of the best! Effortless and easy.

Price: $49.95

Manufacturer:
Electronic Arts
2775 Campus Dr.
San Mateo, CA 94403

Editing

Cut and Paste works like a typewriter. The TAB key generates a tab, SHIFT shifts, and DELETE actually deletes. If you are used to a so-called "full-feature" word processor, such key usage may seem unusual.

After booting the program disk, you use ESC and the cursor keys to select a command at the bottom of the screen. You may select a document from the catalog or BLANK to begin a new document.

To edit text, you use ESC and the cursor keys to select the type of editing you wish to perform. CTRL-A followed by the right-arrow key paints the text for changing. CTRL-C "cuts" it into the buffer and CTRL-P "pastes" down a marked copy of the buffer contents. The other editing commands make just as much sense. CTRL-S moves the cursor to the start of a document, while CTRL-E places you at the end. Text insertion is type-over, rather than push-ahead.

Tabs are pre-set for every five spaces. CTRL-N indents the margin five spaces to the right. To restore the margin you enter a CTRL-R.

All of these commands are also available through the menu at the bottom of the screen—you don't have to use a control sequence if you don't want to.

Printing

Most low cost word processors lose points when it comes to printing. You must specify the number of lines per page and the number of characters per line. *Cut and Paste* bypasses this complicated procedure. Since people measure pages in inches, 8-1/2" by 11", for example, so does *Cut and Paste*. After all, *Cut and Paste* is for people who want to write, not program a computer.

The print function is intelligent enough to remove widows (single lines which belong to a paragraph printed on another page). For example, if the first line of a paragraph falls at the bottom of a page while the rest of the paragraph continues on the next, *Cut and Paste* moves the dangling line to the next page. The same thing occurs when the last line of a paragraph sits alone at the top of a new page; *Cut and Paste* moves it to the previous page. Not even *AppleWriter* can do that!

Cut and Paste will also let you start printing on a new page no matter what the print setting calls for. Just put a series of hyphens on a line by itself and the new line will be printed at the top of a new page.

Utilities

Electronic Arts supplies two disk utilities. Copy-Disk copies a document disk for back up. Format-Disk lets you create new document disks. Only disks formatted with this utility can be used by *Cut and Paste*. *Cut and Paste* is a protected program and cannot be backed-up.

Summary

If you need a word processor for long documents and extensive writing, look elsewhere. *Cut and Paste* offers no search and replace, underlining, boldface, or other extras. Text files are not compatible with Apple DOS text files. But remember for whom *Cut and Paste* was designed. This program is intended for the home user, the person who needs to write short 'etters, lists, thank you notes, and perhaps a speech for civics class. If you now use a typewriter for these jobs, *Cut and Paste* is powerful enough for you. Electronic Arts has proven that they can produce "serious" software every bit as powerful and enjoyab'e as their games. END

CIRCLE 494 ON READER SERVICE CARD

creative computing evaluation software

Put A Computer On Your Family Tree

J. Douglas Leith

Researching your family tree is a gentle sport, a little like bird watching: you try to pin a name on a more or less dimly lit bird, and then you try to describe its character and plumage, often from a distance. It is also a great excuse for domestic and foreign travel to meet your relatives in exotic places.

When you are ready, a librarian can steer you to your nearest genealogical resources and societies, and you can leap backward in time.

When my aunt sent me some family data in 1966, I drew up a family tree and sent it to various relatives, most of whom I had never met. In 1980, I mailed a revision with about 300 names in it and got back a steady trickle of changes. Every new birth, marriage, and death meant typing a whole page over again. I couldn't keep up.

creative computing
SOFTWARE PROFILE

Name: Family Roots
Type: Genealogy program
Systems: 48K Apple, IBM PC, some CP/M systems; 1 to 6 disk drives; optional: clock, lowercase, 80-columns
Format: Disk
Language: Basic
Price: $185 ($86 to Lineages owners)
Manufacturer:
Quinsept, Inc.
P.O. Box 216
Lexington, MA 02173
(617) 862-0404

Apple To The Rescue

Then in 1981 I got my Apple II and met Steve Vorenberg of Quinsept, a genealogist and a programmer. His neat program, *Lineages,* took care of most of my problems. He kept improving it, sending out free revisions to users and in 1982 came out with what has turned out to be an outstanding new version, *Family Roots.* The biggest advantage of the new version is that it has no limit on the number of people it can handle, but in addition there are many subtle improvements that make it a dream to use.

Family Roots comes as a group of interlinked programs on two disks, written in modifiable Basic. Because the data entered for one person are stored before you begin the next, it is impossible to lose any significant amount of information if the power goes off or the cat steps on your RESET key.

The main data entry program is Edit. You enter data in large or small chunks as you wish, with the program assigning identification numbers to new people. As you enter data, *Family Roots* keeps track of the relationships and adds a current calendar date if you wish.

Generally, you enter only once the data common to several people—a great time saver. Entered data are easily changed, either at initial entry or later. You can add special information fields on your people in addition to the basic ones built into *Family Roots.* I added date of baptism, sex, occupation, and cemetery, for instance.

Program and Utilities

Charts is the main printout program. You can print out charts of *predecessors* or three kinds of charts of *descendants* for up to seven generations up to the line length of your printer. And of course it is all automatic. By naming #864, Johann Jacob Tremper, for instance, I can get a 28-page printout of his descendants.

Sheets can print records for individuals (you specify which ones or what range of ID numbers). These go well in a notebook, one person per page, where you can write notes about each as you learn more. Then you can transfer your new data into your computer files with Edit (or Text, below). Sheets also prints "family group sheets," which are fairly standard with genealogists. They are nice to mail to the families involved. I find them hard to use in library research and prefer charts of descendants and predecessors for research use.

Lists makes alphabetically or numerically sorted lists of your people. You can make lists larger than your computer memory by merging shorter lists previously stored on disk. A complete alphabetic list is very useful in the library in conjunction with the Charts. When I run across a likely name, I check the list to see if I have it, and if I do, I take the name with its ID number from the alphabetic list and check it out on a Chart. That way I can either write in the new information by hand on the chart near that name or write it into a notebook if it is a new person. Again, all this will later be entered into my computer files using Edit or Text.

```
Trombour, Annaetje (ID=2)
   (Last Updated 28 Oct 1983)

BORN: ca. 1751
  AT: 'of Ulster Co' 1768
NUMBER OF MARRIAGES: 1
MARRIED TO: Tremper, Johan Jacob (ID=1)
        ON: 26 Jul 1768
        AT: ?Kingston NY
        STATUS: Married
DIED ON: ?
     AT: ?KINGSTON NY
NUMBER OF CHILDREN: 10
    1) Tremper, Christina (ID=510)
    2) Tremper, Wilhemus/William 'Old Citizen' (ID=3)
    3) Tremper, Jacob (ID=511)
    4) Tremper, Jacob (ID=512)
    5) Tremper, Johannes (ID=513)
    6) Tremper, Annatje (ID=514)
    7) Tremper, Catherine (ID=56)
    8) Tremper, Elisabeth (ID=516)
    9) Tremper, Jacob (ID=517)
    10)
FATHER: Trombauer, Johannes (ID=445)
MOTHER: Fiere, Christina (ID=446)
BAPT:
OCC:
CEM:
SEX: F
```

Individual sheet.

Lists now has a "Soundex" capability which allows you to retrieve the files of people whose names sound alike (Tremper, Trumpbauer). You can also collect people from fragments of names. Thus I collected everyone whose first

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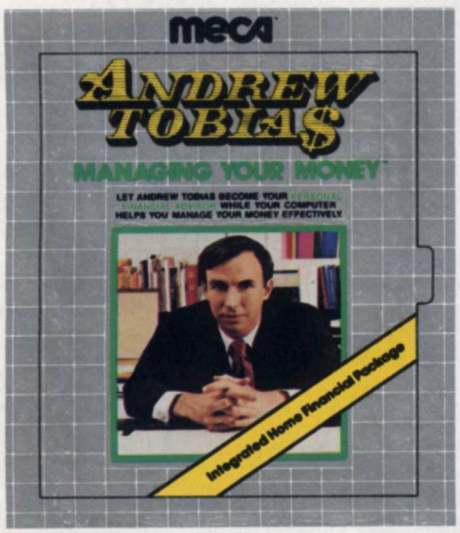

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- Stores memos on an electronic calendar.
- Allows you to record, code and analyze your investments.
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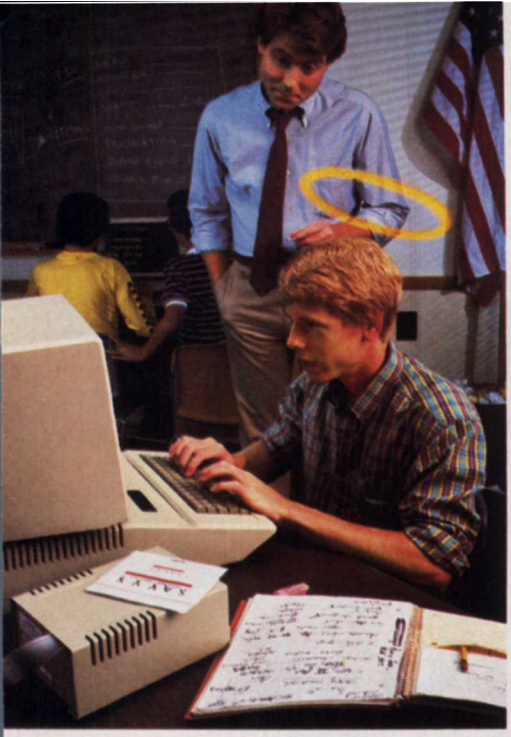

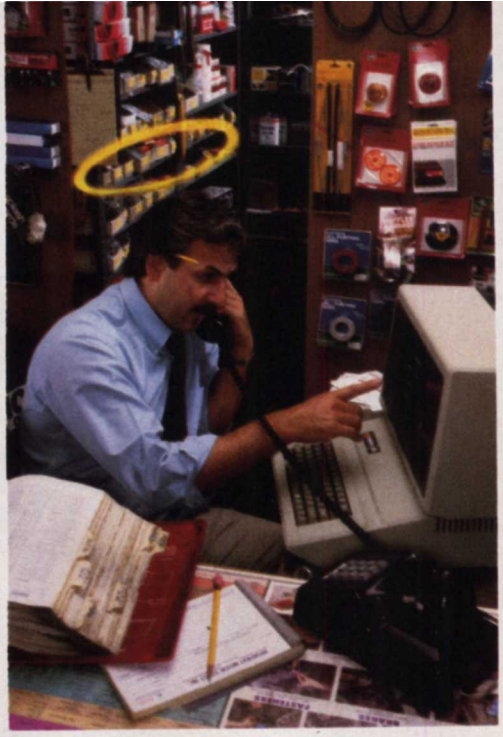

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CIRCLE 129 ON READER SERVICE CARD

name had MARG in it, including the Margarets, Margerys, and Ellenmargies.

Search looks for people satisfying specified criteria. You can find everybody who was born in Las Vegas and died in California between 1960 and 1970, for example.

Text is for storing long pieces of information about individuals, that if put in the regular record under Edit would make the charts messy. The text material is keyed to the person's ID number and can be automatically printed out on the Individual Sheets if desired. There are no limits on length.

The first program you actually use is Configure. This sets the program constants (there are 165) to your own preference and hardware. It can accommodate many printers. Besides hardware adaptation, you can adjust the software, for instance as indicated above in Edit, in dozens of ways; this is the most flexible program I have seen. Every variable can be accessed via Configure, and the complete list is in the manual, telling what each is for and what its original value is: very helpful to tinkerers.

There are several Utilities. You can print blank charts, analyze the type of

```
          DESCENDANTS OF Johann Jacob Tremper  'Sr.' (ID=864)

                                                                 GREAT
                                                          GREAT  GREAT
                                                   GREAT  GREAT  GREAT
                                            GREAT  GREAT  GREAT  GREAT
                                     GRAND  GRAND  GRAND  GRAND  GRAND
PERSON    CHILDREN                   CHILDREN CHILDREN CHILDREN CHILDREN CHILDREN
!         !                          !        !        !        !        !
!Tremper, Johann Jacob 'Sr.' (ID=864)
!     B: ca. 1683 @ Upper Germany*1-?Neuwied*2
!     M: < 1712*1 TO Welker, Christina (ID=865) @ Upper Germany ?Neuwied
!     SEX: M
!     D:  @ NY-?NYC
!     (1: NYGBR 63p227 in part)
!     (2: NYGBSRec 40;159 (T127))
!     (3: to U.S. ca. 1712)
!     2 Children
!         !
!         !Tremper, Johan Jury (ID=563)
!         !     B: ca. 1700 @ Neuweid-Rheinland
!         !     2 Marriages
!         !     M: 24 Oct 1733 TO Denemarken, Lena (Madelena) (ID=562) @ Kingston NY RDC (KgM
!         !        767)
!         !     Widowed
!         !     RM: <1755 TO Tippel/Typel, Susanna (ID=886) @ ?Rhinebeck NY
!         !     SEX: M
!         !     D: betw. 12/1769 and 6/1770 @ ?Rhinebeck NY
!         !     4 Children
!         !     MOTHER: Welker, Christina (ID=865)
!         !         !
!         !         !Tremper, Jacob (ID=842)
!         !         !     B:  @ Kingston NY RDC; KgB4416
!         !         !     2 Marriages
!         !         !     M:  TO Deal, Catharine (ID=841)
!         !         !     RM:  TO Katura ---? (?=Caty=#841???) (NO ID)
!         !         !     BAP: 08 Dec 1734
!         !         !     SEX: M
!         !         !     D: possibly 10-17-1788 @ Rhinebeck NY
!         !         !     8 Children
!         !         !     MOTHER: Denemarken, Lena (Madelena) (ID=562)
!         !         !         !
!         !         !         !Tremper, Lawrence (ID=60)
!         !         !         !     B:  @ Rhinebeck-St.Peters Luth.Co.
!         !         !         !     M:  TO Cataleintje ---?(L14-12) (NO ID) @ Albany 1st Luth.
!         !         !         !         Ch.??
!         !         !         !     BAP: 25 May 1760*2
!         !         !         !     SEX: M
!         !         !         !     (1: OLDEST CHILD)
!         !         !         !     (2: L16-24)
!         !         !         !     MOTHER: Deal, Catharine (ID=841)
!         !         !         !
!         !         !         !Tremper, William (ID=565)
!         !         !         !     M:  TO Delamater, Catharine (ID=564)
!         !         !         !     SEX: M
!         !         !         !     D: 21 May 1835
!         !         !         !     4 Children
!         !         !         !     MOTHER: Deal, Catharine (ID=841)
```

Descendants chart.

```
          PREDECESSORS OF Wilhemus/William Tremper  'Old Citizen' (ID=3)

                                                                 GREAT
                                                          GREAT  GREAT
                                                   GREAT  GREAT  GREAT
                                            GREAT  GREAT  GREAT  GREAT
                                     GRAND  GRAND  GRAND  GRAND  GRAND
PERSON    PARENTS                    PARENTS PARENTS PARENTS PARENTS PARENTS
!         !                          !       !       !       !       !
!         !                          !Johann Jacob Tremper 'Sr.' (ID=864)
!         !                          !
!         !                          !Johann Jacob Tremper 'Junior' (ID=509)
!         !                          !     !
!         !                          !     !Christina Welker (ID=865)
!         !                          !
!         !Johan Jacob Tremper (ID=1)
!         !     !                    !
!         !     !                    !Michael Pfeffer/Feffer (ID=929)
!         !     !                    !
!         !     !Anna Maria Pfeffer (ID=508)
!         !     !     !              !
!         !     !     !              !Dietrich Hofmann (NO ID)
!         !     !     !              !
!         !     !     !Anna Maria Hoffman (ID=930)
!         !     !     !     !        !
!         !     !     !     !        !Anna Elalia (NO ID)
!         !     !     !     !
!Wilhemus/William Tremper 'Old Citizen' (ID=3)
!         !     !     !     !
!         !     !     !     !Niclas Trombauer (ID=425)
!         !     !     !     !
!         !     !     !Johannes Trombauer (ID=445)
!         !     !     !     !
!         !     !     !     !Magdalena Stier (ID=426)
!         !     !     !     !
!         !     !Annaetje Trombour (ID=2)
!         !     !     !     !
!         !     !     !     !Valentin Fiero (ID=471)
!         !     !     !     !
!         !     !     !Christina Fiero (ID=446)
!         !     !     !     !     !
!         !     !     !     !     !Henrich Schram (ID=1521)
!         !     !     !     !     !
!         !     !     !     !     !Fridrich Schram (ID=1513)
!         !     !     !     !     !     !
!         !     !     !     !     !     !Johann Wilhelm Kuester of Darmstadt (NO ID)
!         !     !     !     !     !     !
!         !     !     !     !     !     !Anna Maria Kuester (ID=1514)
!         !     !     !     !     !     !
!         !     !     !     !     !Catharina Schram (ID=470)
```

Free-form pedigree chart.

```
HUSBAND: Johann Jacob Tremper 'Junior'
Born ca. 1712          Place Upper Germany
Marr 01 May 1738       Place NY Ref.Prot.Dutch Ch.
Died                   Place
HUSBAND'S                                          HUSBAND'S
FATHER:  Johann Jacob Tremper 'Sr.'                MOTHER:  Christina Welker
HUSBAND'S
OTHER WIVES:

WIFE: Anna Maria Pfeffer
Born                   Place
Died                   Place
WIFE'S                                             WIFE'S
FATHER:  Michael Pfeffer/Feffer                    MOTHER:  Anna Maria Hoffman
WIFE'S
OTHER HUSBANDS:

 M/F          CHILDREN              WHEN BORN     WHERE BORN        FIRST MARRIAGE     WHEN DIED

 1 F Anna Maria Tremper             01 Mar 1739   NYC

 2 M Johan Jacob Tremper            05 Sep 1740   NYC               26 Jul 1768        08 Oct 1794
                                                                    Annaetje Trombour

 3 F Mary Tremper                                                   Michael Schatzel

 4 M Michael/Michiel Tremper        1745?         NYC               15 Mar 1767        20 Dec 1787
                                                                    Leah Van Deusen

 5 M Johannes Tremper               ----?1743?


SOURCES OF INFORMATION                                             OTHER MARRIAGES

1-NYMilitia 1738 under Capt.Gerard Beekman
2-L5-37
3-Jacob 'W' Tremper; g.s. insc.
4-Freeman of NYC 1769
```

Family group sheet.

```
CHART NO.

                                                                    864 Tremper, Johann Jacob
                                                                        'Sr.'
                                                                    !B ca. 1683 Upper Germany*1-?N
                                                509 Tremper, Johann !M<1712 Upper Germany ?Neuwie
                                                    Jacob 'Junior'  !D  NY-?NYC
                                                !B ca. 1712 Upper Germany
                                                !M 01 May 1738 NY Ref.Prot.Dut!865 Welker, Christina
                                                !D                      !
                                                !                       !B  Upper Germany-?Neuwied
                                1 Tremper, Johan Jacob                  !M<1712 Upper Germany ?Neuwie
                                !B 05 Sep 1740 NYC                      !D  NY-?NYC
                                !M 26 Jul 1768 ?Kingston NY             !
                                !D 08 Oct 1794 KINGSTON NY              !929 Pfeffer/Feffer, Michael
                                !                                       !B
                                !                                       !M  ?NYC
                                !                                       !D 25 Feb 1758 NYC
                                !                       !508 Pfeffer, Anna Maria
                                !                       !               !B
                                !                       !               !M 01 May 1738 NY Ref.Prot.Dut!930 Hoffman, Anna Maria
                                !                       !               !D                      !
3 Tremper, Wilhemus/William     !                       !               !                       !B 1710 NYC
'Old Citizen'                   !                       !               !                       !M  ?NYC
                                !                       !               !                       !D
B --/--/1772 Kingston NY        !                       !               !                       !
M 20 Mar 1820 Kingston          !                       !               !                       !425 Trombauer, Niclas
D 16 Mar 1840 Kingston NY       !                       !               !                       !
                                !                       !               !                       !B --/--/1676 Germany
                                !                       !               !                       !M
                                !                       !               !445 Trombauer, Johannes !D
                                !                       !               !                       !
                                !                       !               !B 05 Apr 1719 West Camp NY !
                                !                       !               !M                      !426 Stier, Magdalena
                                !                       !               !D Before 28 Jun 1785   !
                                !                       !               !                       !B c. 1680 German Palatinate
                                !2 Trombour, Annaetje   !               !                       !M
                                !                       !               !                       !D
                                !B ca. 1751 'of Ulster Co' 176!         !                       !
                                !M 26 Jul 1768 ?Kingston NY   !         !                       !471 Fiero, Valentin
                                !D ? ?KINGSTON NY             !         !                       !
                                !                             !         !                       !B ca. 1695??
                                !                             !446 Fiere, Christina             !M
                                !                             !                                 !D
                                !                             !B 1721 Kingston NY               !
                                !                             !M                                !470 Schram, Catharina
                                !                             !D after 8/1769                   !
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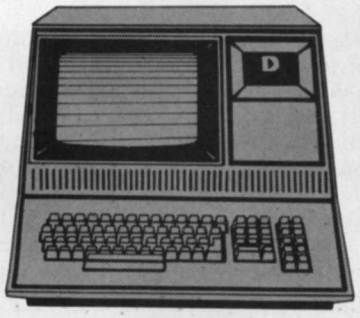
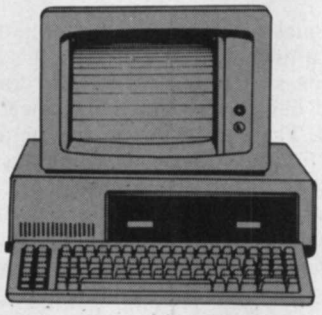
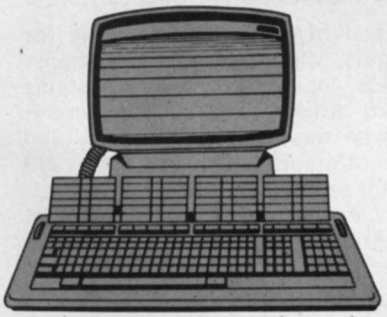
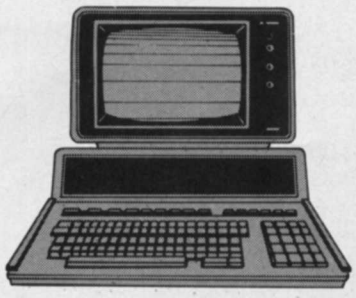
Standard pedigree chart.









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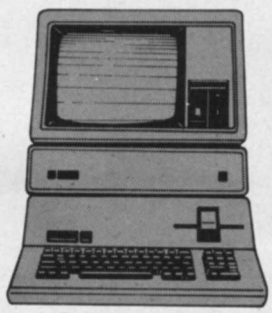

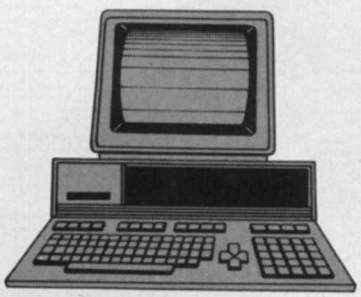

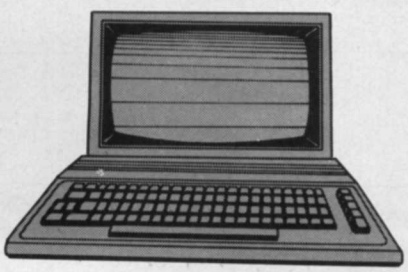

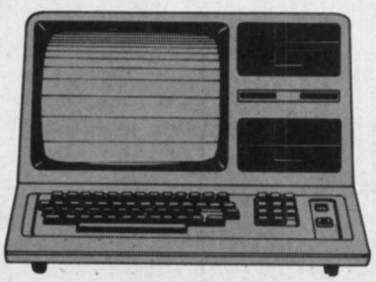

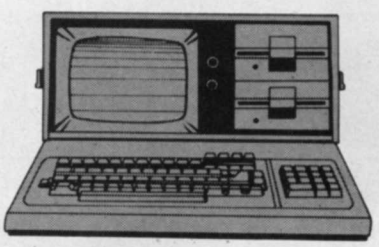

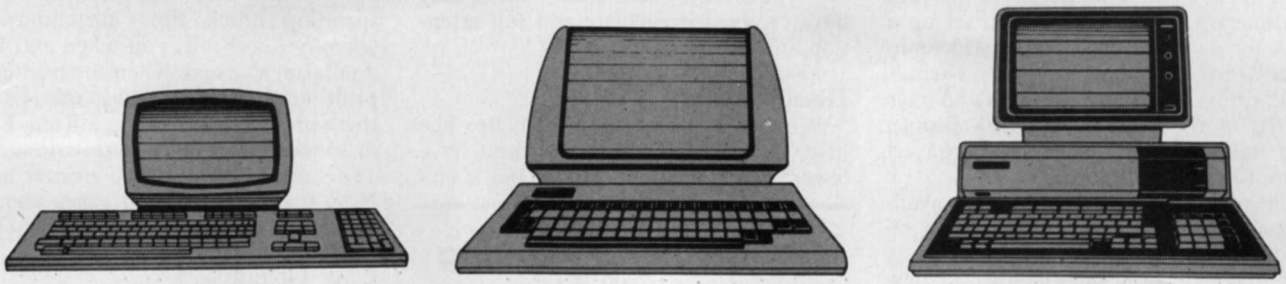

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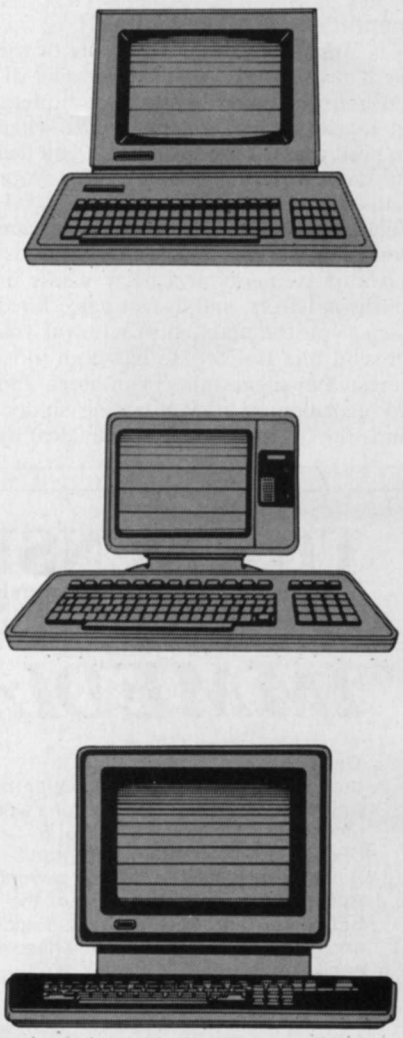

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CIRCLE 160 ON READER SERVICE CARD

disk in the drive and its more important parameters if it is a data disk, set up a disk for data storage, reassign ID numbers to individual people or to a whole disk, print out all the addresses you have stored in the records of living people, and take *Lineages* data and convert them to *Family Roots* data.

There is also a new utility disk available for an additional $20. Changer allows you to change the disk formatting and move your old records into the new format. This robust program can also be used to transfer records from Apple disks to Rana Elite-3 disks.

Documentation and Support

The Instruction Manual is one of the best I have seen. It is clear, simple, direct, conversational, friendly, complete, and logical. It has examples just when you need them. When you use it you feel you have a friend looking over your shoulder.

The vendor support for this program is outstanding. All along, Steve has issued improvements every few weeks or months in letters, and in fact has offered to send you the updated program if you will send him a disk. He has been most interested in suggestions from users, and is a genealogist himself so he understands the users' needs. I usually deal by letter, but my occasional phone calls have received immediate and full attention and netted good advice.

Disadvantages

Would you believe *none?* Really! The program *might* be overkill if you have fewer than 200 or 300 names, but if you have begun your own family tree, you know you can't stop there.

I recommend working on your family tree as a hobby, and Family Roots as the instrument to use.

A word processing program serves well for fewer names, since with it you can insert and delete lines and characters easily. But it can only print out the data in the exact form in which you type it.

A mechanical, not a software problem arises with very large trees. With the standard setup of two disks and an Epson MX-80 printer, I found that my 28-page printout took two hours to create. Much of this was because the descendants were being selected from 1500 names on four disks, and I was spending much time switching disks (*Family Roots* tells you when and how). And also, as usual, when the printer was printing, the computer was idle. I solved these problems by getting a Rana Elite-3 disk, which can hold 2300 names, and a 16K buffered Grappler+ printer board. Now the same printout takes about 45 minutes, and there is no disk switching.

User Group

There is now a *Quinsept User Group* (5855 Santa Teresa Blvd., San Jose, CA 95123). The last newsletter says that "Family Roots" is now available in a CP/M version for the Kaypro and Osborne; this version is said to run also "under generic MS DOS using the MBasic interpreter."

So. To wrap up, I most enthusiastically recommend working on your family tree as a hobby, and *Family Roots* as the instrument to use. If you spread the very reasonable cost over the number of years of fun you will have using it or over the number of relatives you will end up with, it is ridiculously inexpensive. And it will greatly multiply the amount of information you can manage and thus the pleasure and knowledge you can bring to yourself and family. END

CIRCLE 452 ON READER SERVICE CARD

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*April 1983, Softalk magazine reader survey.
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CIRCLE 211 ON READER SERVICE CARD

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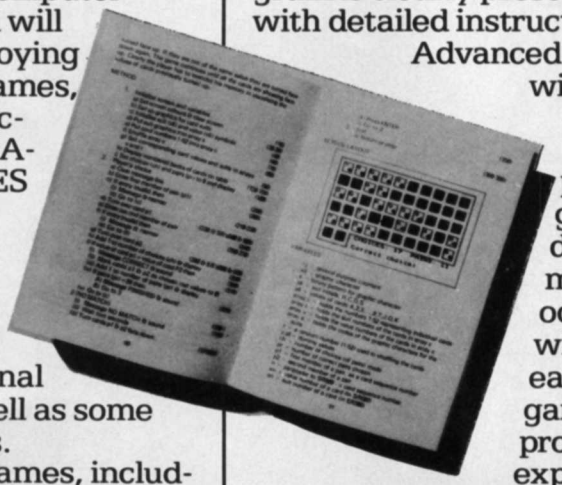
CREATIVE GAMES
FOR THE
TIMEX-SINCLAIR 2068

BY ROBERT MAUNDER

Even the most seasoned computer professional will admit to enjoying computer games, and the selections in CREATIVE GAMES FOR THE TIMEX-SINCLAIR 2068 are a mix of completely original games as well as some old favorites.



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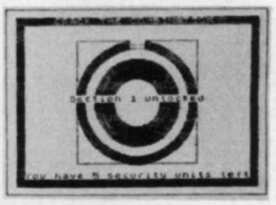

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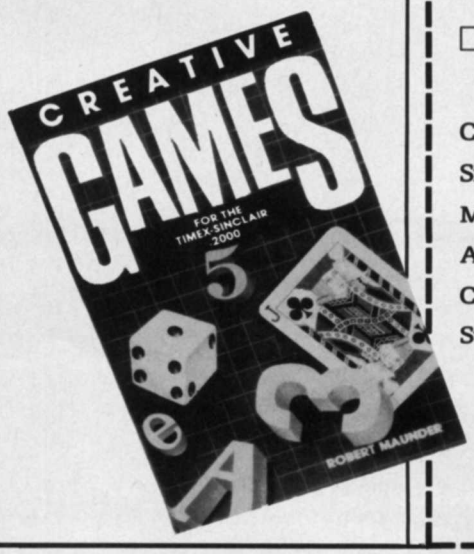

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CIRCLE 215 ON READER SERVICE CARD

creative computing software evaluation

The Einstein Memory Trainer

Brian J. Murphy

Almost everyone seems to have blind spots when it comes to memory: matching names with faces, remembering important dates, recalling phone numbers. Now your Apple II, which almost never forgets anything, can be used to give your brain a 16 megabyte upgrade.

The tool for the job is *The Einstein Memory Trainer*, developed by a team of psychologists to help the average user to improve basic memory skills.

Key Word Memorization

The authors say we memorize by visualization and association. With *Memory Trainer* you learn to create an image that you link with the data you memorize. In the first lessons you are shown a simple but effective way of memorizing first names. You learn to select images to match names displayed on screen. The images can be objects that rhyme with the names (*chain* for Jane or *shark* for Mark) or conceptual images like *dollar bill* for Bill and *bobsled* for Bob. These are called key words.

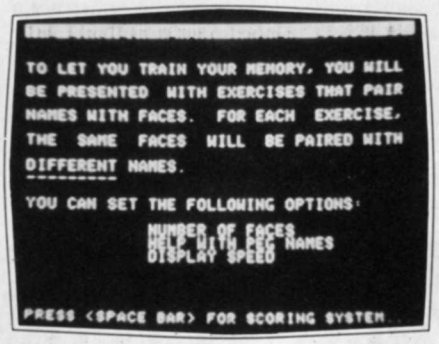
Having created your key word images you then learn to link them with the faces of the people whose names you are trying to remember. You create a composite mental picture of the face and the key word image that will immediately make the name come to mind. The lessons teach you to make the image vivid, even ridiculous, so that the key word and then the name will spring immediately to mind.

A memory game tests your ability to visualize. You are shown from five to twelve faces, the names that go with them and the key words you selected to help you remember the names. As each face reappears on the screen, you type in the name. At the end of each game you see a score including the percentage of correct answers. If more work is needed, the program lets you know.

The lessons also teach techniques of recall by loci, memorizing data by associating it with locations. In this lesson you are given a set of random objects that you are instructed to associate with a set of locations in a theatre. With the locations and associated objects memorized, another memory game evaluates your skills. Again you are told if your skills need more work.

The next lesson develops skills in making the association between locations and abstract or semi-abstract concepts that are harder to visualize. The procedure for memorizing and testing in this area repeats the procedure for concrete objects.

Some of the objects in the exercises which the authors claim are especially hard to visualize (such as *milk* and *town*) don't seem to pose much of a visualization challenge, but you can make your own judgment. It is conceivable for some users that the transition from what the authors call concrete to conceptual visualizations may be a substantial achievement.



creative computing
SOFTWARE PROFILE

Name: Einstein Memory Trainer

Authors: Michael G. Samet, Dov Rubin, R. Edward Geiselman

Type: Memory training lessons

System: 48K Apple II or IIe

Format: Disk

Language: Machine language

Summary: Effective memory training adult educational software.

Price: $89.95

Manufacturer:
The Einstein Corporation
11340 W. Olympic Blvd.
Los Angeles, CA 90064
(213) 477-4539

Memorizing Numbers

The tutorial goes on to teach number memorization using peg words. For each number you are taught there is a symbolic sound or sounds. They are 0 = Z or S, 1 = T or D, 2 = N, 3 = M, 4 = R, 5 = L, 6 = J, S or C, 7 = K or hard C, 8 = V or F, and 9 = B or P.

The sounds derive from the names of the numbers or the shapes of letters which, with a little imagination, you can detect inside the numeric character (for example, a backwards nine is a P, an eight looks like a handwritten small F, and a 3 on its side is an M).

Exercises drill you in the creation of key words for longer numbers. For example, using the table above could you deduce which number is represented by the key word CaRT? The answer is 741 (7=K or C, R=4, and T=1). What key word you use for each number is, of course, up to you, but to use these lessons you must accept Einstein's suggested letter values for number characters.

You will recall how loci were used to remember various concrete objects and abstract concepts. You now learn that number key words can be used like loci to recall long numbers of items in ordered lists. Let's say you have three numbered items: 1. String, 2. Bug, and 3. Nest. By using your key words for each of the numbers as loci (possible examples would be 1=kiT, 2=kNee, 3=Ma) then visualizing the key word/object combination, you could quickly recall all the objects by number. One thing is obvious, you had better settle on one set of key words for numbers 0-9, or you will be spending as much time memorizing key words as you would the numbered objects.

Picture a pilgrim with a tail topped by a comb.

Einstein teaches a system for memorizing dates; you use key words for numbers, along with key words of your own selection for the months. The program suggests key words derived from the names of the months and from seasonal associations (e.g., *pilgrim* for November, *bride* for June). Using number peg words you construct a series of visual associations which represent an entire date, then you combine the key word for the month with the key words for the day and year.

An example: Picture a pilgrim with a tail topped by a comb. This visual image should bring to mind the key words *pilgrim* (for November), TaiL (which equals 15) and CoMb (73), giving you the date November 15, 1973.

The lesson links names with dates, again using the peg word system. The object of the exercise is to help you to remember anniversaries, appointments, and other dates linked with specific individuals.

The fifth and final lesson is designed to help you to memorize phone numbers. As with the other lessons you use peg words to memorize the numbers. The lesson gives you practice linking numbers with names, again by using visual associations.

Once you have mastered the five lessons, you can play the Memory Mix game, a sort of graduation exercise in which you are shown a series of faces for which you must memorize names, birthdays, and phone numbers.

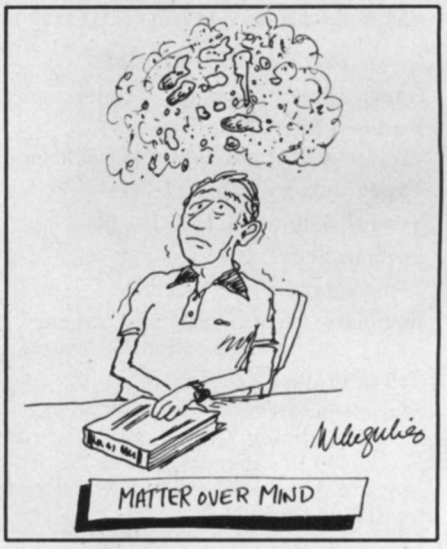
Summary

The methods of memory training used in this program appear to be quite valid. Even though I have a fairly good memory, I found that I was able to memorize data with a good deal less difficulty using the *Memory Trainer* techniques.

This is sound educational software that can be used with a minimum of on-screen directions or references to the printed manual. The memory games have been designed with great care to be as amusing as they are challenging. The hi-res graphics used to illustrate the program range from smooth to crude, but they do the job of effectively reinforcing the lessons at key points.

The documentation is very well written and could stand alone as a good memory training course. With the software, the *Einstein Memory Trainer* is a very potent memory improvement system. END

CIRCLE 453 ON READER SERVICE CARD



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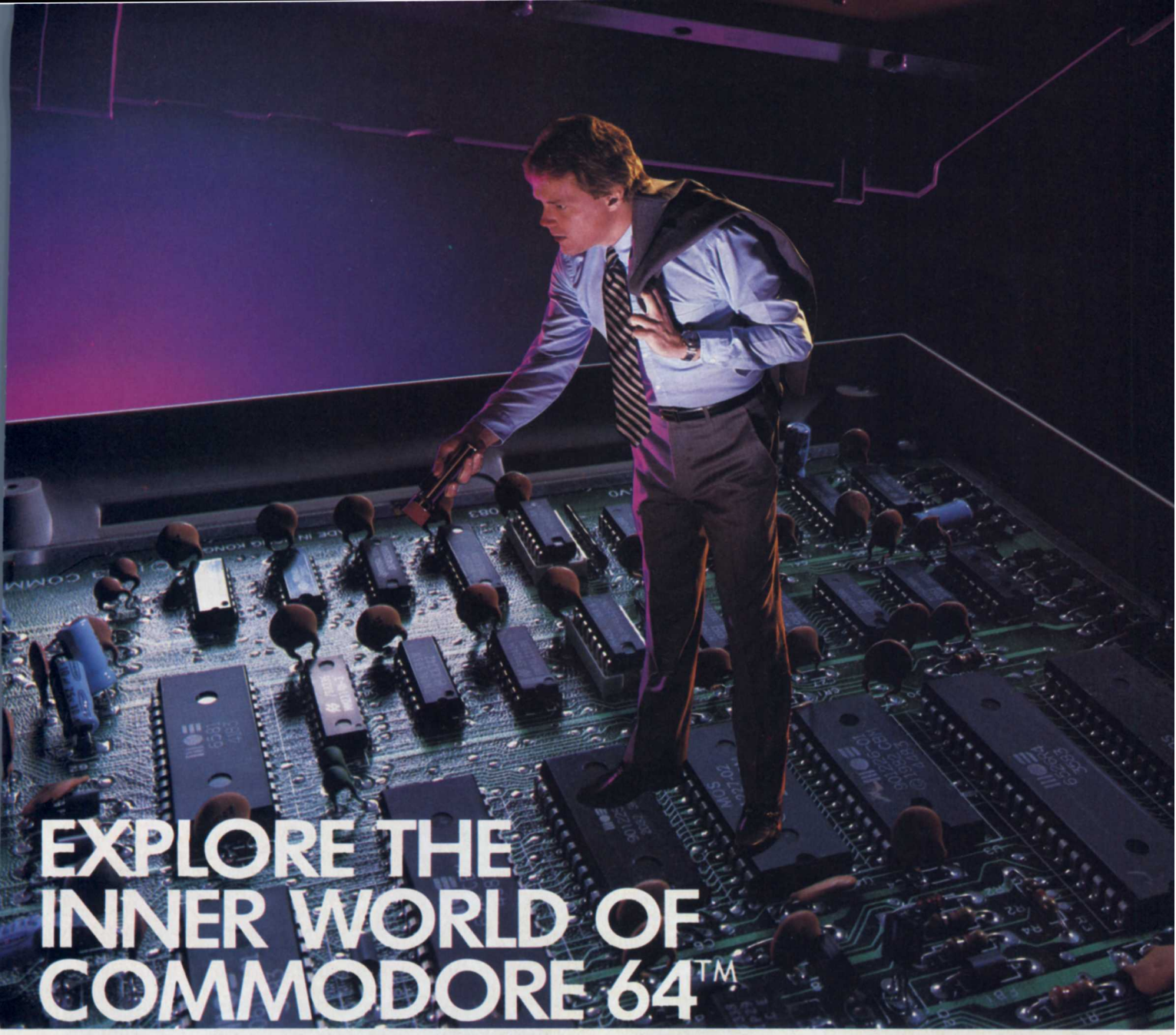

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CIRCLE 166 ON READER SERVICE CARD

creative computing evaluation software

Thirteen Great New Games

David H. Ahl

Are you looking for a little R & R (rest and relaxation) with some challenge thrown in for good measure? Here are thirteen new games released over the past six months which provide something for every taste. Some games are based on popular coin-op arcade games; others are adaptations of the old themes; still others are completely new.

As with most games, we have found that playing equipment is very important to the enjoyment and playability of the game. Most of these games use a joystick, and a good third-party joystick will make them much easier to play and far more fun.

Spare Change

Spare Change is a zany game that takes place in a coin-op game arcade. Two fun-loving Zerks have escaped from their coin-op machine and are trying to save up enough tokens to retire. You are the hapless owner of the arcade trying to keep the Zerks around. To do so, you must fill up the token bins at the left of the door to the Zerk Show before the Zerks can collect five tokens in their piggy bank.

This sounds a bit weird, and it is! The arcade runs on a token economy, so to do most things, you must convert your money to tokens. To fill up the Zerk Show token bin, you must get tokens from the token machines on the floor. But if a token machine is empty, you must go to the cash register and get dollar bills to put in the token machines. And if the cash register is empty, you have to go to the safe for the money bag. You can also check the coin return on

creative computing
SOFTWARE PROFILE

Name: Spare Change
Type: Action game
Authors: Dan and Mike Zeller
System: 48K Apple, Atari, C64
Format: Disk
Summary: Cute, humorous, novel theme.
Price: $34.95
Manufacturer:
Broderbund Software
1938 Fourth St.
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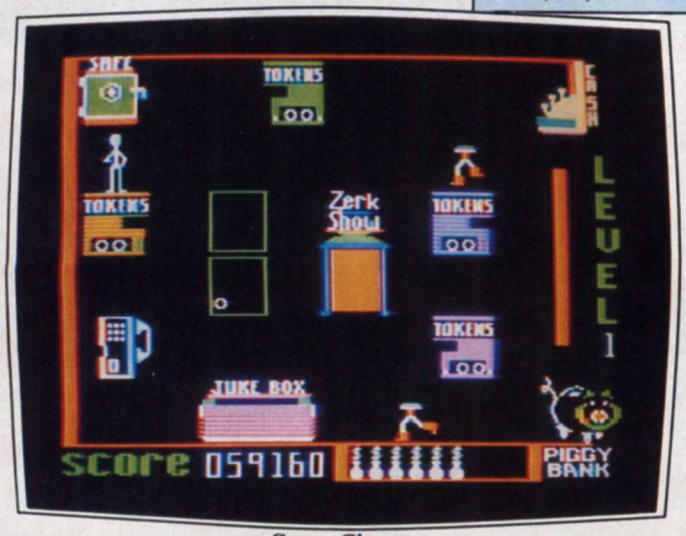

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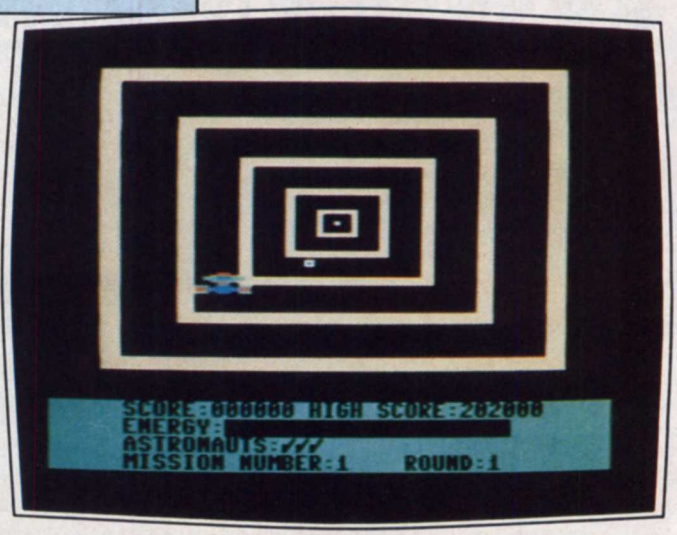

Cosmic Tunnels, screen 2

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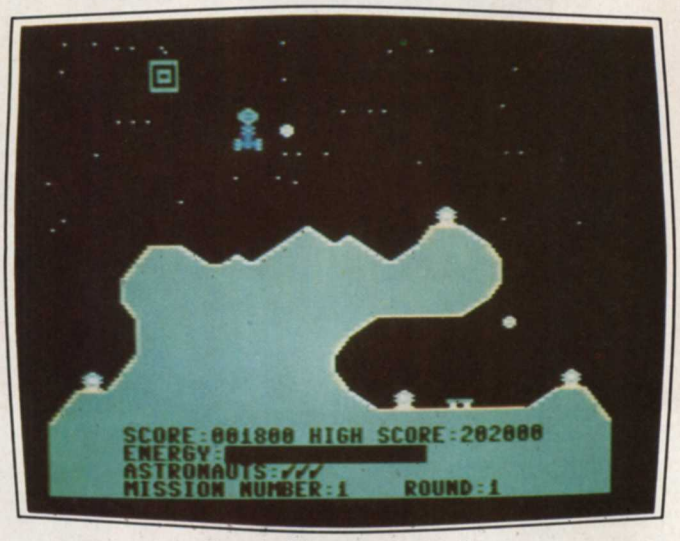
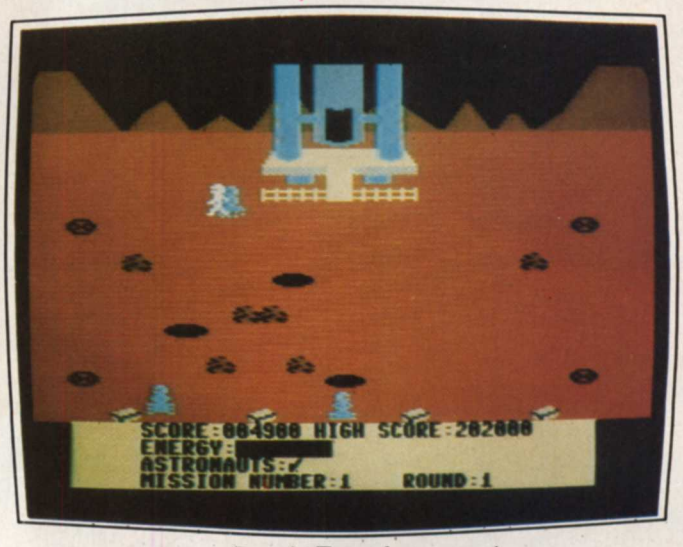


Cosmic Tunnels, screen 3



Cosmic Tunnels, screen 4

the pay phones; occasionally a careless caller leaves a token behind.

Luckily for you, the Zerks are easily distracted and you can use that to your advantage. If you put a token in the jukebox, the Zerks can't resist dancing deliriously. At upper levels, you can start the popcorn machine and ring a pay phone, both of which distract the Zerks.

If you manage to get 18 tokens in the Zerk Show bin, you may go through the door and are treated to a short animated cartoon show. On the other hand, if you have ten or more tokens (but fewer than 18), you can dash in the Zerk Show door and get them credited to your account. This is sometimes a wise strategy if the Zerks are getting close to filling their bank as it forces them (and you) to start over.

The mischievous Zerks like to steal tokens from the token machines, telephones, and even the Zerk Show bin. You can get a token back if you catch the Zerk with it, but they are tricky lil' guys and will toss it back and forth among themselves before tossing it into their piggy bank, so it is not easy to catch one with it.

An amazing feature of the game is the "Zerk Control Panel." This lets you modify the Zerks' behavior. You can change how well they kick tokens into their bank, how smart they are (likelihood of moving to a full token machine), their greed, accuracy, bumping, tossing, and how long they stay mad when you steal a token back from them. Of course, if you make the game easier, new high scores will not be saved on the disk.

This is a very cute game with outstanding animation and a novel theme. Some of our action arcade fanatics found it a bit boring at the lower levels, but as you move to the upper reaches, the boredom dissolves quickly—assuming you still have the strength to grip the joystick. The background noise is a bit tedious, but the music of the jukebox is catchy, and the sounds are well integrated with the visual action.

The game has all the professional touches that we have come to expect from Broderbund: pause, sound (high, low, off), keyboard or joystick, change joystick axes, restart, and view high scores (top ten saved to disk). Gags, surprises, and humor—you'll love these Zerks.

CIRCLE 454 ON READER SERVICE CARD

Cosmic Tunnels

We first saw *Cosmic Tunnels* at the Datamost booth at the Summer Consumer Electronics Show. Captain Sticky and his lovely Stickettes were at the booth inviting us to play. At the time, it seemed like a challenging game, but it is difficult to do a complete evaluation amid all the distractions of a trade show—not to mention the Stickettes.

Now, in the comfort of our own computer room we have played the game at leisure and can confirm our initial impressions—it is an excellent game with four diverse screens that will keep you challenged for hours, or days, or weeks.

You are the pilot of a spacecraft with a twofold mission: destroy enemy spacemines and missile launchers and retrieve as many energy fuel bars from four distant asteroids as possible. Successfully visit all four asteroids—save your planet from energy starvation—and prepare for round two!

creative computing
SOFTWARE PROFILE

Name: Cosmic Tunnels
Type: Action game
Authors: Tim Ferris and Jay Ford
System: C64, Atari, Apple
Format: Tape or disk
Summary: Four screens of varied, challenging action.
Price: $34.95
Manufacturer:
Datamost
8943 Fullbright Ave.
Chatsworth, CA 91311
(213) 709-1202

The graphics of Cosmic Tunnels are stunning.

On screen one you must guide your spaceship from homebase on the bottom center of the screen to one of the four colored tunnel gates at the top of the screen. This is reasonably easy except that you must dodge falling meteors and avoid hitting the sides of your own base. As on all the flying screens, your joystick controls the engines, but your spacecraft doesn't respond immediately to changes in thrust. Thus, planning is as important as quick reflexes.

On screen two, you find yourself in one of four tunnel gates for a 25-second flight. You score points by shooting space mines as you fly through a simulated 3-D tunnel.

When you exit the tunnel on screen three, you must attempt to land on the asteroid. This is complicated by missile fire from enemy defense systems. You can use your fire button to drop bombs

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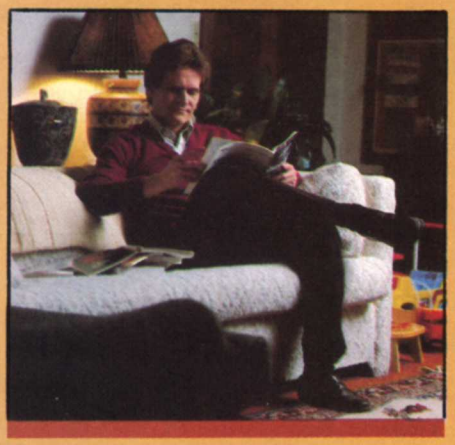

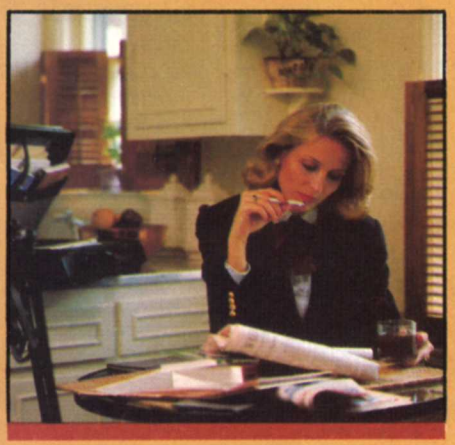

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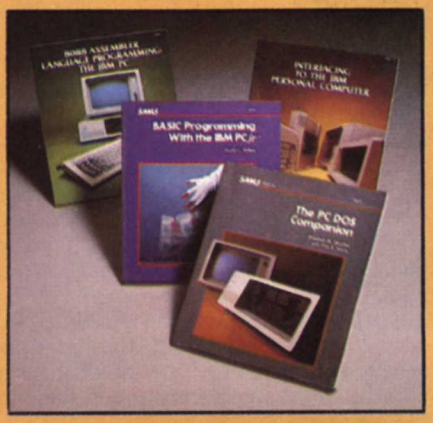

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CIRCLE 169 ON READER SERVICE CARD

on the enemy bases. Move your ship to the landing pad to get to the next screen.

Screen four is the tough one. You emerge from your ship at the top and must pick up energy bars at the bottom and return them to your ship. The dangers and foes vary, depending upon which asteroid you are on. You must watch out for Space Turkeys, Dynobots, Electric Lizards, and Monstrous Munchers. All have their own peculiar habits and foibles. As if they weren't enough, there are dangerous quicksand bogs, too.

On this screen are four launch pads in the corners. From these, you can use either your jetcopter or rocket springs to aid your movement around the terrain. When you have retrieved all the energy bars, you must retrace your route (screens 3, 2, and 1) back to homebase.

The game ends when you have either lost all your astronauts or run out of energy. If you have one of the top ten scores, you can save your initials to disk although we found that making entries with the joystick was less than reliable.

The graphics of *Cosmic Tunnels* are stunning, but the sound effects are mediocre. Nevertheless, the game is a real challenge that will keep you coming back for more, and more, and more.

CIRCLE 455 ON READER SERICE CARD

Q*bert

*Q*bert* is one of the best and most popular coin-op arcade games to come along in recent years. The theme is unique, the character is cute. The visual effects are colorful, and the aural effects feature a fascinating variety of grumblings, grunts, squishes, screams, mumblings, and bops. So it is no wonder that Parker Bros. licensed it from Mylstar Electronics for the home market.

Versions for several computers and video game units are now available. We playtested the Commodore 64 and ColecoVision versions and found them substantially similar. They are, however, somewhat different from the Gottlieb arcade game, and patterns developed on the coin-op unit generally will not work on the home versions. On the other hand, overall strategies and game play are the same.

So who is this Q*bert whom everyone has come to love? He is a cute little orange character with a long nose who roams the 28 squares that form the face of a three-dimensional pyramid. Each time he jumps on a square, it changes color. The object of the game is to change all the squares to a target color which may require one, two, or more jumps.

Sharing the face of the pyramid with Q*bert are a variety of balls and nasty creatures, most of whom conspire to prevent Q*bert from completing his task. You direct Q*bert's jumping with the joystick held in a diagonal orientation. Hold it down and he hops as fast as he can, but be careful or he will hop right off the edge to an untimely death.

Meanwhile, a constant barrage of red balls drops from the sky to roll down the pyramid threatening to give Q*bert a fatal blow on the head. In addition, there is a purple ball that instead of rolling off

Coily is your worst enemy, because unlike the other creatures, he follows you.

the bottom of the pyramid turns into Coily, the snake with the perilous pounce. Coily is your worst enemy, because unlike the other creatures, he follows you. This can be turned to your advantage because you can lead Coily to the edge and then hop onto a spinning disk which takes you to the top of the pyramid. The unthinking Coily follows and plunges to his death.

On the third round a new character, Ugg, makes his appearance. Unlike the balls, the Uggs appear on the bottom and work their way upwards, ready to jump on poor lil' Q*bert. Fortunately, when the Uggs are about, the red balls aren't, so you don't have to deal with both sets of dangers until much later in the game.

Slick is a raindrop-shaped devil who, like the balls, makes his way down the face of the pyramid, but he changes the color of the squares, thus undoing Q*bert's work. Slick can be stopped by jumping on him—a move that is good for 300 extra points.

The green ball is the only good thing on the screen. If Q*bert hops on it, all the nasty characters freeze for a moment

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SOFTWARE PROFILE

Name: Q*bert

Type: Arcade game

Systems: Atari, C64, TI, most video game units

Format: Cartridge

Summary: Best new theme in 1983.

Price: $29.95

Manufacturer:
Parker Brothers
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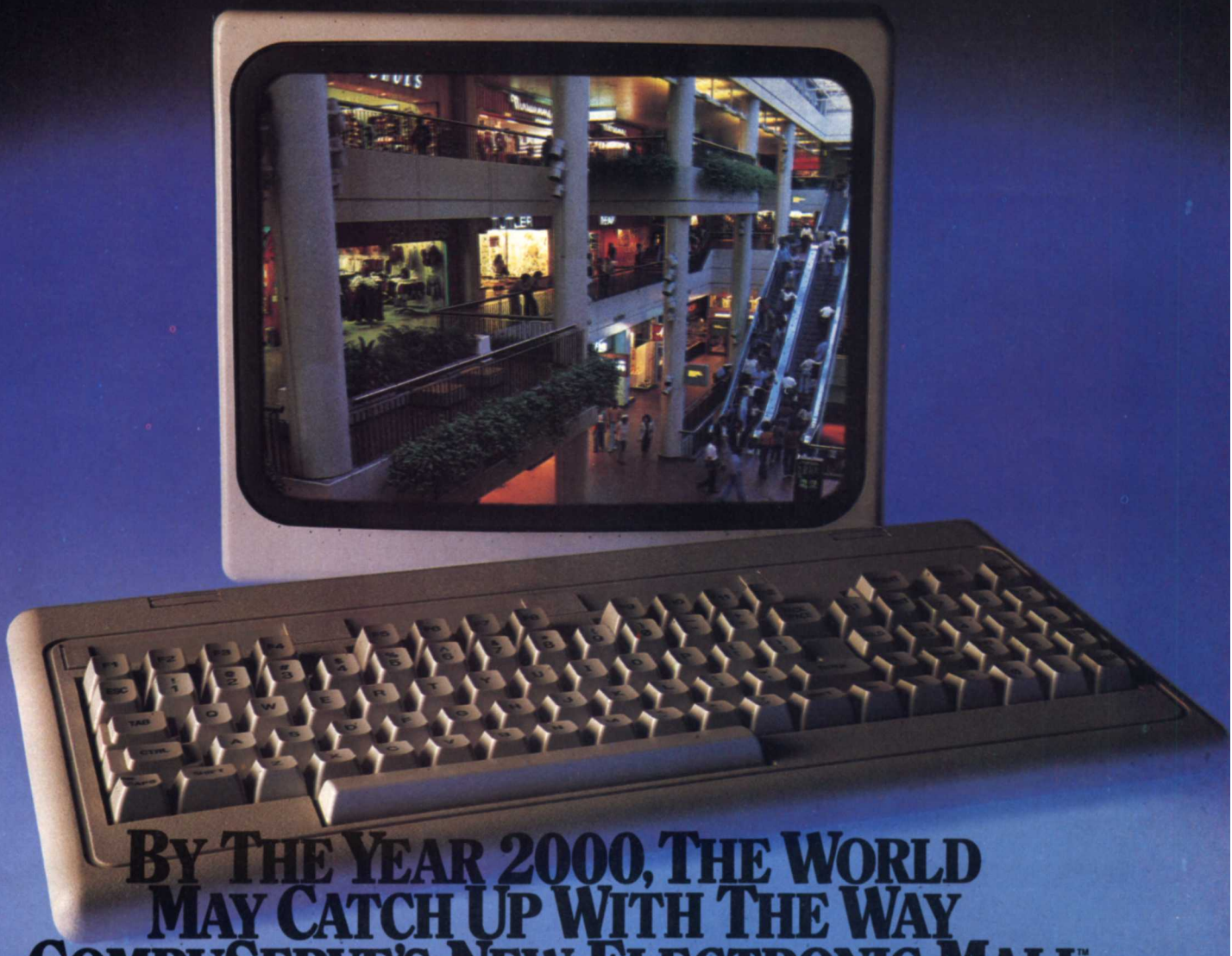

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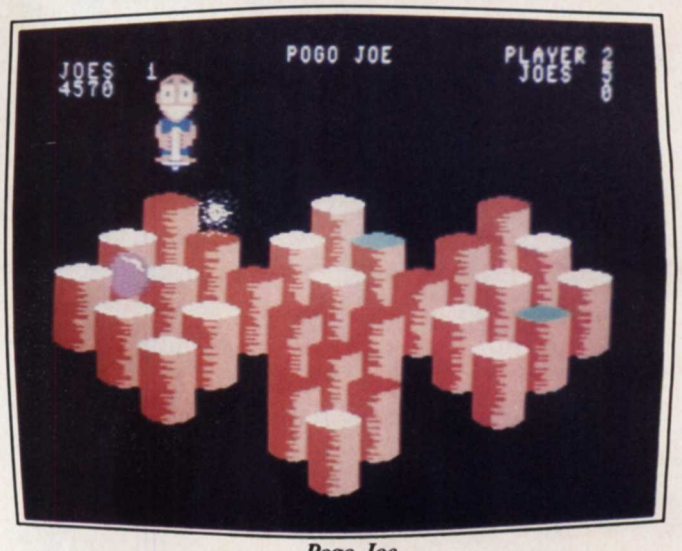
*Q*bert*



Pogo Joe

while Q*bert can continue to move around.

The round ends when all the squares have been changed into the destination color. There are nine levels with four rounds on each level. On level 1, hopping on a square once changes it to the target color. Level 2 requires two hops on a square. Level 3 requires just one hop, but if you hop on a square a second time, it changes back to the original color. Level 4 is like level 2 except hopping on a square that is the target color will change it back to the intermediate color. Level 5 is also like level 2 except hopping on a target color square changes it back to its original color. On higher levels the speed and frequency of appearance of the characters both increase.

The game ends when you are out of Q*berts. You start with three and get an additional one at 8000 points and for each additional 14,000 points. The game can be played by one or two players; on two-player games, players alternate turns.

*Q*bert* is an imaginative game that has spawned a host of imitators, but there is no game like the original. Get hoppin' with this cute lil' guy, and we think you'll see why.

CIRCLE 456 ON READER SERVICE CARD

Pogo Joe

Pogo Joe is a distant cousin of Q*bert, but unlike Q*bert, Pogo Joe bounces around on a pogo stick and is somewhat more "player friendly." Moreover, he has 64 different screens on which to bounce around.

The object of the game is to make Pogo Joe change the colors of the tops of groups of cylinders. You move him around with a joystick, and each time he jumps onto a cylinder it changes color. Unlike Q*bert, Pogo Joe is smart enough not to jump off the cylinders into the great void; if you push the joystick in a direction where no accessible cylinder exists, he will simply hop up and down.

Pogo Joe is one of the most addictive and playable games we have seen.

When all the tops are changed (later screens take two or three jumps to change a cylinder into the target color), a new screen appears.

As each new screen appears, Pogo Joe materializes in a random location on top of a cylinder. Thus, it is difficult, if not impossible, to work out playing patterns, and the game presents a new challenge each time you play.

Sharing the screen with Pogo Joe are several creatures. They explode onto the screen as eggs, which Pogo Joe can catch. But after a few bounces, the eggs hatch into various toy monsters. The yellow ones run away from Joe, and he gets points for catching them. The more dangerous purple and blue ones chase Joe and cause him to lose a life if one catches him. The red guys change the cylinder tops back to their original colors as they jump around.

Each board has one or more flash tubes which, when jumped upon, explode all the monsters and eggs on the screen at that time. Later boards have two or more transport tubes which move Pogo Joe to another transport tube when jumped upon.

All monsters and eggs are worth 250 points, and a bonus Pogo Joe is given for each 5000 points. The top ten scores are recorded on the disk. Just to give you some incentive, the game designer, William F. Denman, Jr., has left two scores on the disk, 16,120 (which will soon disappear) and 207,900 (which will not).

After the title screen, a menu screen appears which allows you to structure Pogo Joe for the number of players (one or two), joysticks, starting screen, speed of Pogo Joe (0 to 6), speed of monsters (0 to 6), and whether monsters are allowed to double jump. The RUN/STOP key will pause the game at any point.

Some of the boards present a greater challenge than just jumping. On board 5, Enzyme Stew, for example, the cylinders disappear after they are jumped upon. On bord 10, Heart Like A Head, the cylinders are invisible until they are jumped upon. The names of the boards occasionally are descriptive, but more often just cute, for example, Mutant Street,

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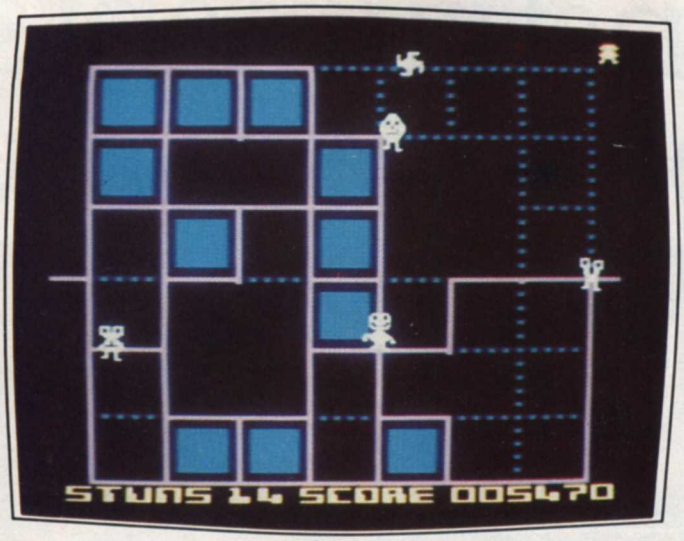
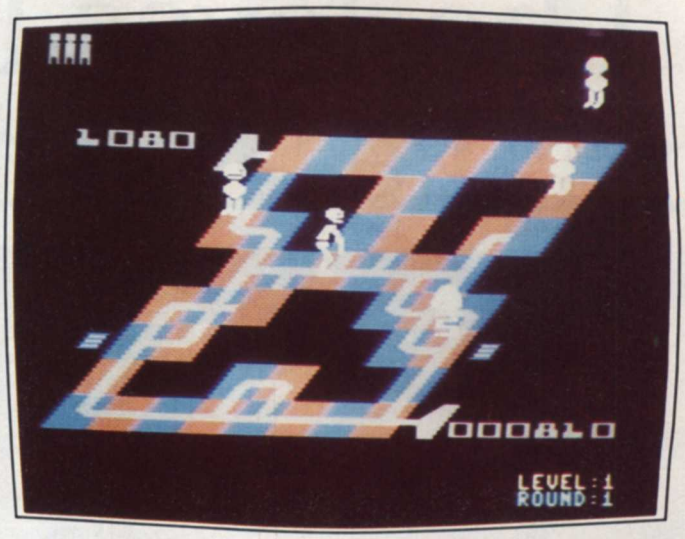
SOFTWARE PROFILE

Name: Pogo Joe
Type: Arcade game
Authors: W.F. Denman, Jr. and O.W. Steele
System: C64, Atari, IBM PC; joystick needed
Format: Disk or tape
Summary: Highly playable and addictive.
Price: $24.95
Manufacturer:
ScreenPlay
P.O. Box 3558
Chapel Hill, NC 27514
(919) 493-8596



Kid Grid



Juice

Terror Lunch, Lopsided, Lumpy Gravy, Fish Head, The Pits, and ARRGH!

The music and sound effects signal various events (losing a life, gaining a new life, birth of a monster, etc.) but we quickly tired of the rather short repetitive tune that constantly plays in the background. But that is what the volume control is for.

All in all, *Pogo Joe* is one of the most addictive and playable games we have seen. We tried the Commodore 64 version, but we assume the Atari and IBM versions are similar.

CIRCLE 457 ON READER SERVICE CARD

Kid Grid

If you have been to a personal computer show in the past year or so, you probably have met Kid Grid, a cute little guy dressed up like the package design of this software package.

Kid Grid, the game, is loosely based on Stern's Amidar arcade game, although there are so many differences that no one will ever accuse them of being the same game. Your mission is to guide Kid Grid around a six by seven grid (appropriate!) and trace over all the lines. As a square on the grid is surrounded by traced lines, the square changes to a solid blue.

Sharing the grid lines with Kid Grid are four meanies of varying intelligence.

Sharing the grid lines with Kid Grid are four meanies of varying intelligence. Some follow pre-determined patterns while others seem to pick up Kid Grid's trail almost immediately. Needless to say, a collision with one of these guys is lethal. The best strategy is to stay as far away from these meanies as possible, but if you are on a collision course, you can use a stun grenade which momentarily halts all the meanies in their tracks.

When you get all the squares on a board colored in, the next board appears—with fewer grid lines, and, of course, fewer squares to surround. Unfortunately, with fewer grid lines, you will find yourself trapped by meanies more often.

Adding to the fun is a roving question mark which occasionally appears in a square for a limited time. If you manage to surround it before it disappears, you earn some extra points. The top ten scores are displayed at the end of a round—or should we say the top nine, since game designer Arti left on the disk a score of 45,000 which will be tough to wipe out. Unfortunately, scores are not stored on the disk.

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SOFTWARE PROFILE

Name: Kid Grid
Type: Arcade game
Author: Arti Haroutunian
System: C64, Vic 20, Atari
Format: Disk or tape
Summary: Fast, fun, and addictive.
Price: $34.95
Manufacturer:
Tronix Inc.
8295 S. LaCienega Blvd.
Inglewood, CA 90301
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The sound effects are nothing to get excited about—three repetitive notes and various chirps and whistles to signal certain events, but you can always turn down the volume. The initial menu allows you to select one of five skill levels and the number of stuns (3, 5, or 7).

All in all, we found *Kid Grid* to be one of the most playable and addictive games around. It is cute, fast, and fun.

CIRCLE 458 ON READER SERVICE CARD

Juice

Juice is the latest Tronix game from Arti 'Kid Grid' Haroutunian. In a sense, the theme is similar to *Kid Grid*—even simpler in a way—but delightfully maddening.

Your job is to guide Edison, a kinetic android, around a printed circuit board (arranged in grid squares) so he can automatically make all the right connections. From time to time, a collection of cute little critters, called Nohms, appears on the top of the PC board and bounces toward the bottom. They do not

creative computing
SOFTWARE PROFILE

Name: Juice
Type: Arcade game
Author: Arti Haroutunian
System: C64, Vic 20, Atari
Format: Cartridge or disk
Summary: Simple and maddening.
Price: $34.95
Manufacturer:
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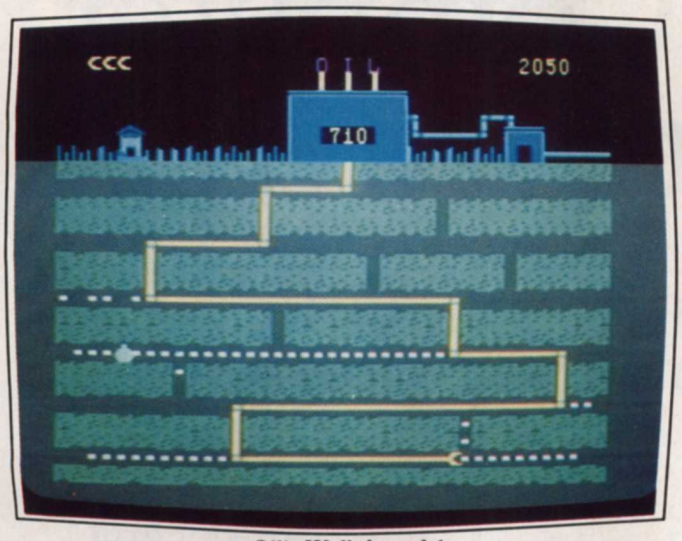
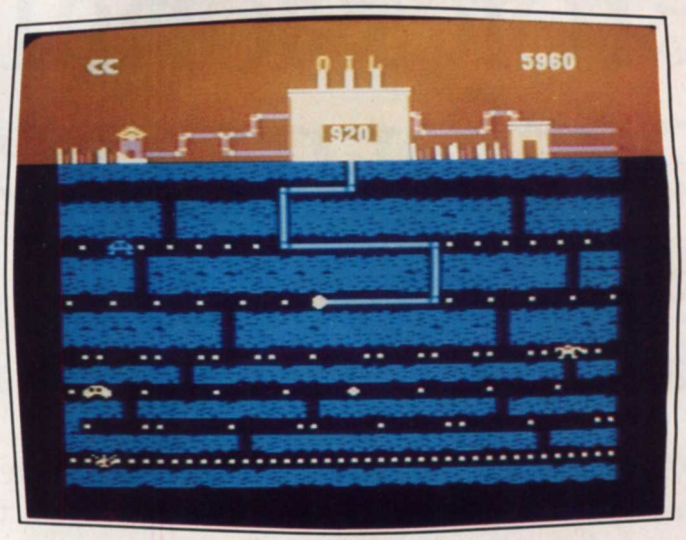


Oil's Well, board 1



Oil's Well, board 2

chase Edison; but you must stay out of their way.

Unfortunately, one mutant Nohm stays behind and turns into a capacitor (still harmless), and finally into the cunning Killerwatt (anything but harmless). Killerwatt is out for blood (or is it juice), and bounces after Edison fast as a flash. You can electrocute him if (a big *if*) you can lead him to a particular spot on the side of the PC board.

Adding to the fun is a character called Flash, the lightning dolt, who appears from time to time and disconnects everything in his path.

Adding to the fun is a character called Flash, the lightning dolt.

The only good guy is Recharge. Bump into him, and the other guys stop moving for a few seconds.

You get points for completing parts of the circuit, touching Flash or Recharge, leading Killerwatt off the board, and completing a bonus round (after three regular boards) within the allotted time. There are six levels of difficulty, each consisting of three regular boards and a bonus board. As would be expected, higher levels have fewer paths and are more difficult to complete.

Game designer Arti has left a high score of 28,000 on the disk; unfortunately scores are not saved to disk but displayed only at the end of a round. Three years ago, the sound effects would have been considered great; today, we judge them rather tedious.

Juice is a simple game to learn and play. It is maddening too, but that is part of its attraction. We liked it; we think you will too.

CIRCLE 459 ON READER SERVICE CARD

Oil's Well

You're rich! A huge oil deposit has just been discovered on your land. But you have to get it out of the ground before you can sell it.

Upon loading the game, you see a cross section of underground passageways, all filled with pellets of oil (pellets?). Your object is to send down drill bits (you have only three) and lay pipe to suck up the oil pellets. It would be easy except that sharing the passageways with your pipeline are oozies (which will attack your pipe and eat right through it) and land mines (left over from a war ages ago). Your drill bit will suck up an oozie, but you must be aiming at him head on.

There are also some good things down there—small, super-rich oil deposits contained in glowing goblets and, way down deep, a petromin nugget which temporarily slows down the oozies.

As you extract the oil from each of your eight fields, construction workers are busy overhead building a refinery. When you clear all of the fields of oil, your refinery will be finished, and you can move to Easy Street.

Oil's Well has three playing speeds: Regular, Unleaded, and Premium. You use the joystick to drill in any direction, and the fire button to retract your drill bit. The sound effects are nicely tied in with game play.

Oil's Well has three playing speeds: Regular, Unleaded, and Premium.

Our playtesters used two distinctly different strategies of play: some went for as many oozies as possible and stayed on the upper levels, while others went for the deep oil first and mopped up the upper level later. Whichever strategy he used, all players agreed that *Oil's Well* had an interesting, new concept, and was delightfully addictive.

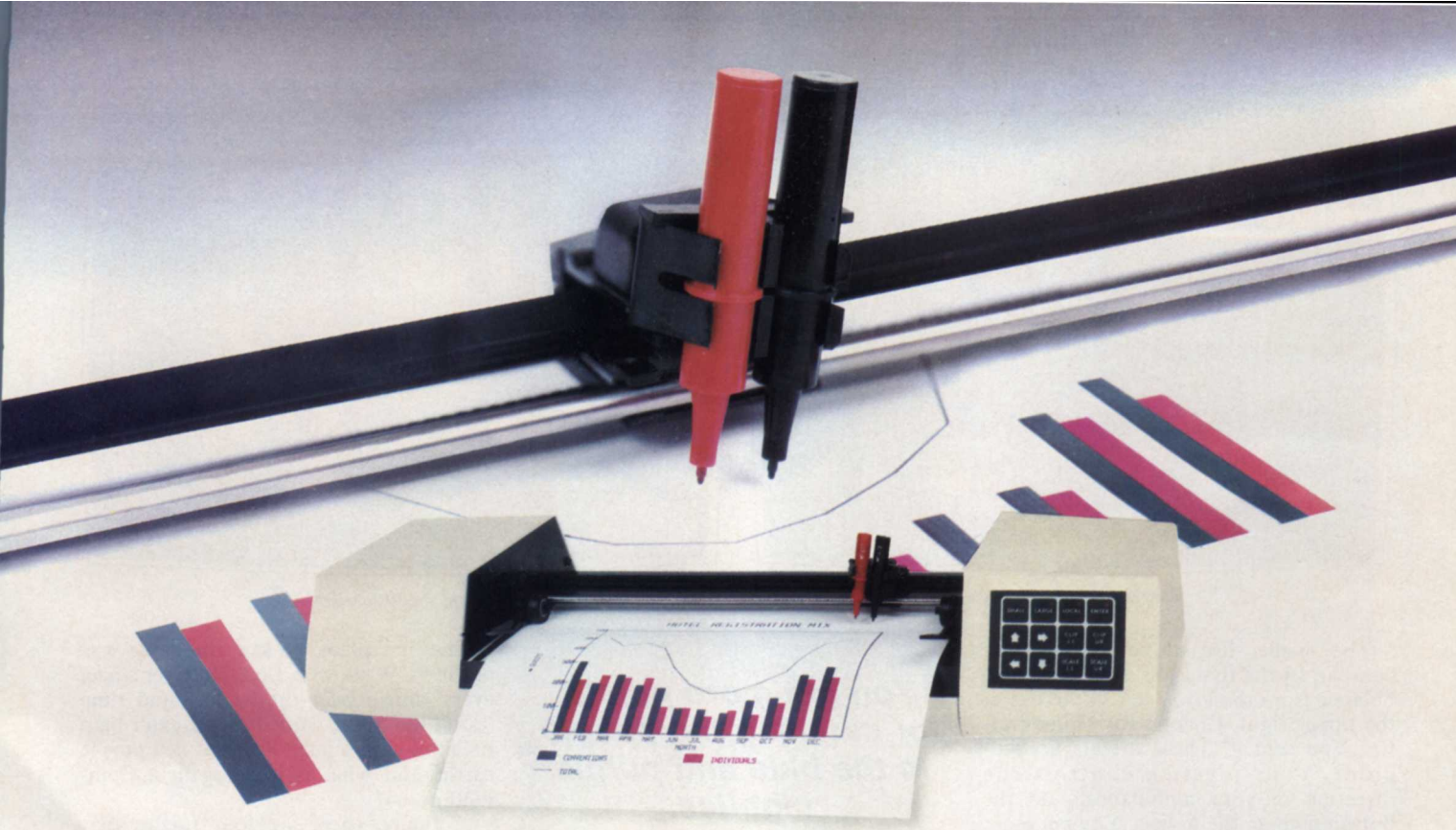
CIRCLE 460 ON READER SERVICE CARD

creative computing
SOFTWARE PROFILE

Name: Oil's Well
Type: Arcade game
Author: Thomas Mitchell
System: C64, Atari, Apple
Format: Disk or cartridge
Summary: Fast and furious underground drilling.
Price: $34.95 cartridge; $29.95 disk
Manufacturer:
Sierra On-Line
Sierra On-Line Building
Coarsegold, CA 93614
(209) 683-6858

Rescue Squad

"Be a hero. Join the Rescue Squad." At least that is what it tells us on the package. It goes on, "Race your ambulance safely through chaotic rush hour traffic to the burning building. Catch the people leaping from the fire, then enter the building and rescue the remaining tenants."



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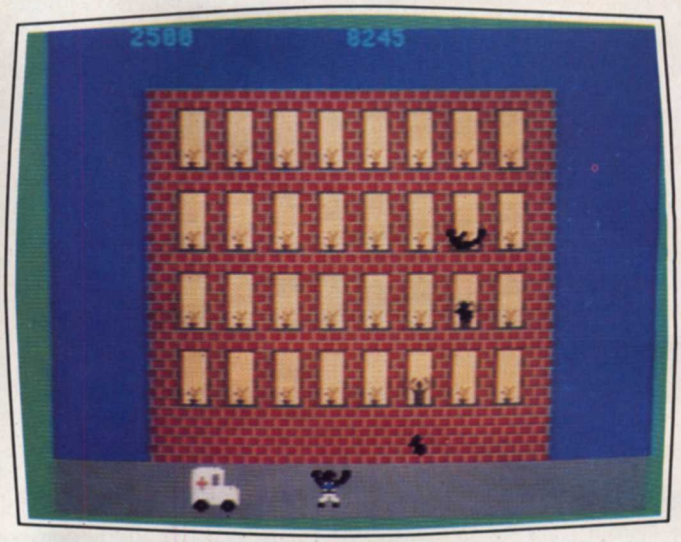
CIRCLE 134 ON READER SERVICE CARD

Rescue Squad, screen 1



Rescue Squad, screen 2

The game has three screens (or boards). In the first, you drive your ambulance from the lower left to the fire at the upper right. Chaotic rush hour traffic? You said it! These drivers are suicidal. Your joystick controls the direction of your ambulance, and the button puts on the brakes. You get more points for reaching the fire quickly, but you don't get any if you crash; hence, we found that a quick jab on the brakes before making turns was generally wiser (and safer) than driving flat out.

The second screen is something like *Kaboom!* with you running back and forth at the base of the building trying to catch crazed people leaping from the rooms above. Unfortunately, their wild leaps also launch flower pots which must be avoided if at all possible. This is a good screen on which to accumulate points, as long as you can avoid those pesky flower pots. You get more points for catching the people in the blue and purple nighties than the others. After being bopped by three flower pots, presumably you are deemed unsuited for this job, and you find yourself on one of the upper floors of the building.

You get more points for catching the people in the blue and purple nighties.

From there, you must make your way through the maze of hallways and offices rescuing people and carrying them, one at a time, back to the window through which you entered. Complicating your task are the two or more fireballs that move randomly through the halls just waiting to singe you and your victim. There are a few blue asbestos jackets which you can put on to protect you from the fireballs for a short time.

If you rescue everyone before you have lost all your rescuers, you are returned to the first scene at the next highest skill level, but with an additional rescuer. The game has nine skill levels, and you can elect to start at any one you wish. The background music is the type played during "The Perils of Pauline" in the silent movie era—it is most appropriate.

Rescue Squad is good fun and has the thoughtful touches that make it a lasting game: a pause key, top ten scores stored on disk, responsive joystick action, cute music, and three varied boards. We like it.

CIRCLE 461 ON READER SERVICE CARD

creative computing
SOFTWARE PROFILE

Name: Rescue Squad
Type: Action game
Author: John Kutcher
System: C64
Format: Disk
Summary: Fast action, three varied boards.
Price: $29.95
Manufacturer:
Muse Software
347 North Charles St.
Baltimore, MD 21201
(301) 659-7212

Purple Turtles

Are you looking for a cuddly cute game that will make you laugh and chuckle and giggle and smile? Look no further—*Purple Turtles* is it.

The first place we saw the game was at the PCW show in London. Ever since, every time I hear the background tune (don't know the name of it), I can't help breaking into a grin. So what is a purple turtle, and what is it doing in a Commodore 64?

Actually, there are four turtles that obligingly provide you with a footbridge across a stream—most of the time, that is. Because, you see, turtles occasionally like to take a short swim and if you try to jump on one as he submerges, you get dunked. For every apple you bring back from the right side of the stream to the hungry owl (yes, owl!) on the left, you get 100 points—and the owl does a little dance.

If you get all six apples before the time runs out, you get a bonus based on the remaining time. Then, it is on to the second round (bananas). And on and on.

If this sounds too tame, you can always play at a higher speed (0 to 9) or level (0 to 9). At the higher levels several turtles may dive together, so you have to anticipate when each one will come to the surface.

creative computing
SOFTWARE PROFILE

Name: Purple Turtles
Type: Cute and cuddly
Authors: Mark and Richard Moore
System: Commodore 64
Format: Tape or disk
Summary: You'll love these turtles.
Price: $24.95 cassette; $29.95 disk
Manufacturer:
Quicksilva, Inc.
426 West Nakoma
San Antonio, TX 78216
(512) 340-3684

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CIRCLE 157 ON READER SERVICE CARD

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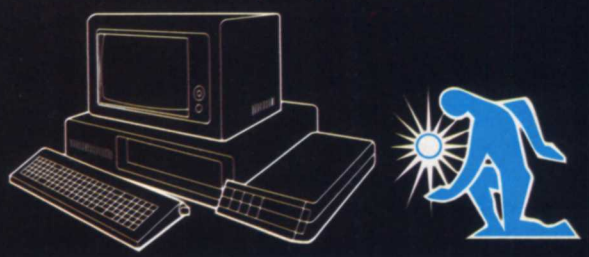

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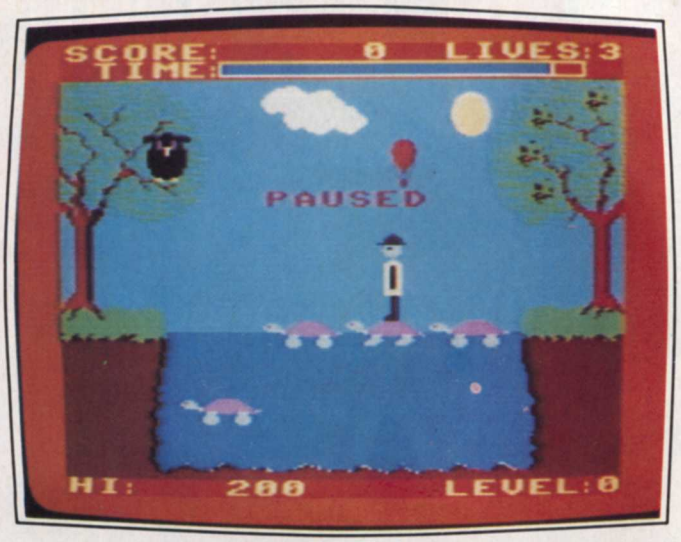

Purple Turtles

Space Action

The cuddly graphics include billowy clouds, hot air balloons, and the paddling feet of the turtles. The top ten scores are displayed after each game, but, unfortunately, not saved on the disk. Mercifully, the tune plays only during the attract mode, and the sound effects during play are quiet and unobtrusive.

With not a smidgen of violence, this game should appeal to young and old alike. It gets our nomination for the cutest game of the year.

CIRCLE 462 ON READER SERVICE CARD

Space Action

Harking back to the good ole days (four years ago), many space games had you flying across the screen shooting everything in your way. The rules were simple (blast everything), the controls were easy to remember (joystick and firing button), and the action was fast and furious. In an effort to provide more challenge, this class of game today is characterized by all kinds of additional features: humans to be rescued, fuel to be replenished, targets on the ground as well as in the air, enemies approaching from behind, and more than one weapon system.

Do you ever hanker for one of the older, simpler games? If so, *Space Action* may be your answer. You fly your ship from left to right (we found the best place to be was about one third of the way from the left edge of the screen) and fire your laser cannon at anything approaching from the right. You also have a shield that will protect you from enemy spacecraft, but once something hits it, it takes about one second to recharge.

There are eight sectors, each with a different type of enemy (flying saucers, spectral rocks, space snakes, etc.). Some of these enemies are intelligent and track you while others just fly in a straight line. The eighth sector is the toughest because it has a few of each type of enemy. When you successfully pass through all eight sectors, you enter the next level and gain another ship.

There are no options, and the scoreboard shows only the current game score and the high score for the session. The sound is what you would expect: booms, whooshes, and whistles. But *Space Action* is easy to play, and the action is fast and challenging.

CIRCLE 463 ON READER SERVICE CARD

creative computing
SOFTWARE PROFILE

Name: Space Action
Type: Arcade game
Author: Arne Fernlund
System: C64, Vic-20
Format: Cartridge
Summary: Old time space shoot-'em-up.
Price: $24.95
Manufacturer:
Handic Software, Inc.
5090 Central Hwy., Suite 7
Pennsauken, NJ 08110
(609) 663-0660

Robotron: 2084

You have surely seen Robotron: 2084 in the arcades; it was Williams' big hit of 1982. *Video & Arcade Games* magazine called its graphics "stunning" and its pace "exhilarating." We are happy to report that most of the excellence has been preserved in the home version.

The theme of the game is that the Robotrons, an advanced species of robots, have taken over the earth. They are determined to destroy humanity or reprogram the survivors, turning them into destructive mutants. Only you and a handful of human clones (why not just plain humans?) remain. Your mission is to defeat wave after relentless wave of robots and rescue as many humans as possible.

There is no tricky terrain to maneuver around and no corridors to follow; this game takes place in a wide open room.

The Brains are your most diabolical enemy, but fortunately they appear only every fifth wave.

You find yourself in the center with the robots and humans milling about. You can destroy the robots by shooting them (of course) or by luring them into galvanizing electrodes placed randomly around the room.

There are seven types of robots, each with different characteristics and weaponry. The Mindless Grunts pursue you relentlessly; let one touch you and you are dead. The Hulks can not be destroyed; you must avoid them at all costs. The Sinister Spheroids don't pose much of a threat themselves. Nevertheless, they should be stopped quickly before they release the deadly Enforcer Embryos who launch Enforcer Sparks at you. The Brains are your most diabolical enemy, but fortunately they appear only every fifth wave. The Brains are deadly because they fire Cruise Missiles that chase you around the screen and because they can reprogram the humans into

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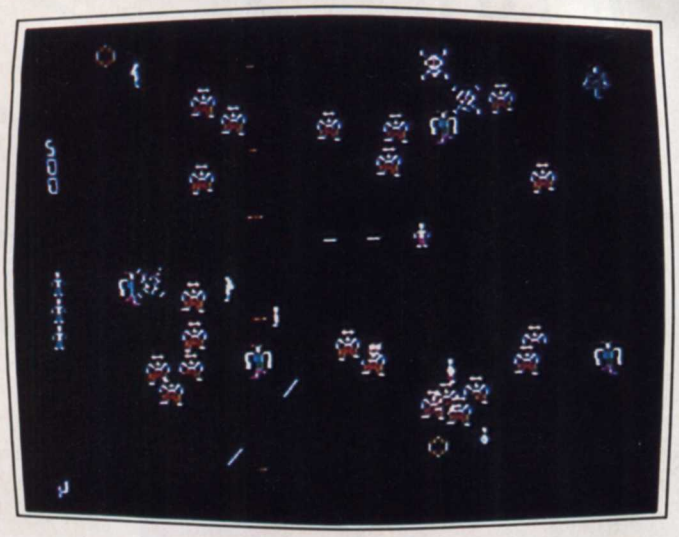
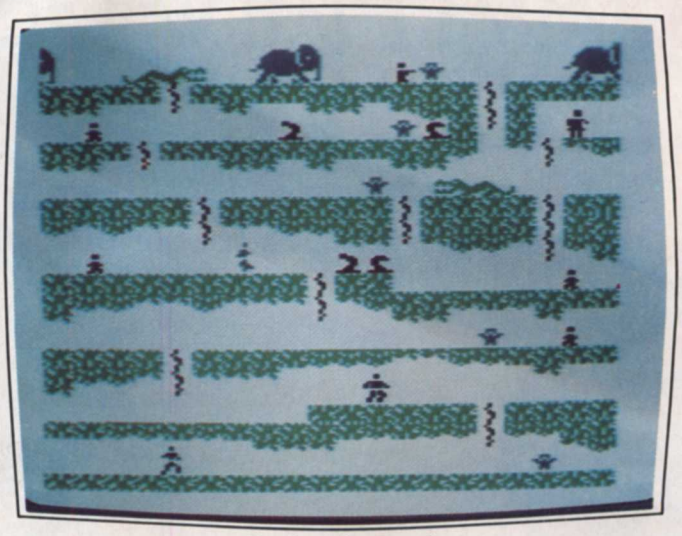


Robotron: 2084



Floyd of the Jungle

creative computing
SOFTWARE PROFILE

Name: Robotron: 2084
Type: Arcade game
Author: Eugene Jarvis
System: C64, Atari, Apple, IBM PC, TI
Format: Cartridge
Summary: Authentic version of the arcade game.
Price: $44.95
Manufacturer:
Atarisoft
1399 Moffet Park Dr.
Sunnyvale, CA 94086
(800) 538-8543

kamikaze-like Progs who then viciously turn against you. The Cubic Quarks and Torturing Tanks round out the list of nasties.

The arcade game is played with two joysticks, one for movement and one for firing; unlike most other games, you can shoot in one direction and move in another. For the home version, the designers have provided both this option (with joysticks in ports one and two) and a single joystick method of control. You point the joystick in a direction and hit the firing button; it then continues to fire in that direction while you move about. To change the direction of fire, you simply press the button again when your stick is pointing in the desired direction. It is tricky to get the hang of it at first, but it comes with practice. While the two-joystick method is true to the arcade game, unless you have a secure way of mounting both sticks, it is next to impossible to play that way. On the other hand, this option is great for two players!

Options include one or two players, nine levels of difficulty, and control by one or two joysticks. Serious arcade gamers report that *Robotron: 2084* is an awesome game but that it takes an awesome number of quarters to become proficient at it. Now, thanks to Atarisoft, you can save those quarters, and play the game in the comfort of your own home.

CIRCLE 464 ON READER SERVICE CARD

Floyd of the Jungle

Floyd of the Jungle is a "rescue the heroine" game similar to Donkey Kong with one major difference—you are competing against two other players (one human and one computer controlled, or two computer players).

On the first board, instead of the girders in Donkey Kong, you have to run along ever higher layers of the jungle (branches of a large tree?) connected by vines. Each layer has various hazards as well as birds and pygmies which can be captured or knocked out for bonus points.

Frankly, we found the easy level offered plenty of challenge.

The layer just below the lovely Janice has an endless parade of crocodiles spaced just close enough that you can't run from one vine to the next without dealing with at least one croc. The final vine leading to Janice is a tough one to catch, but with practice, you will be able to grab it with one hand.

As we have come to expect with these games, Janice again is carried away, and you have an even more difficult board with which to contend. As you go on, you encounter elephants (you can ride them), snakes (bad news), monkeys, tigers, poison darts, and more. Jungle sounds and native drums play continuously, but have nothing to do with the action in the game.

The game may be played by one to four players at three different skill levels. Frankly, we found the easy level offered plenty of challenge (we are tempted to say frustration), and we rarely reached the third board.

If you are really into the Donkey Kong type of games and want every variation for your library, then you will want *Floyd of the Jungle.* But we think that there are others on the market that offer better playability and more fun.

CIRCLE 465 ON READER SERVICE CARD

creative computing
SOFTWARE PROFILE

Name: Floyd of the Jungle
Type: Arcade game
Author: Sid Meier
System: C64, Atari
Format: Disk or tape
Summary: Frustrating Donkey Kong variation.
Price: $29.95
Manufacturer:
MicroProse Software
1 Caribou Ct.
Parkton, MD 21120
(301) 357-4739

Save New York

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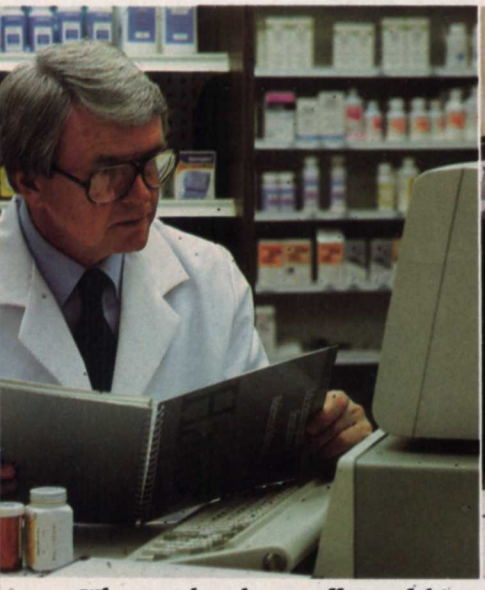
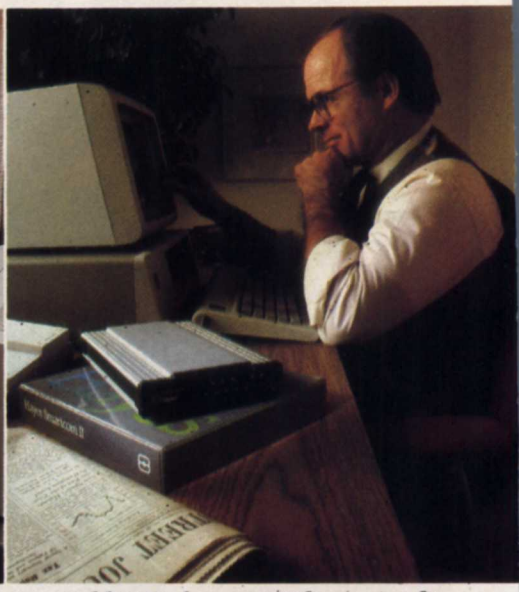


What are the adverse effects of this compound?

Gary: The pedigrees for next week's auction are as follows...



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CIRCLE 133 ON READER SERVICE CARD

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Smartmodem 1200B. (Includes telephone cable. No serial card or separate power source is needed.)

Smartcom II communications software.

NOTE: Smartmodem 1200B may also be installed in the IBM Personal Computer XT or the Expansion Unit. In those units, another board installed in the slot to the immediate right of the Smartmodem 1200B may not clear the modem; also, the brackets may not fit properly. If this occurs, the slot to the right of the modem should be left empty.

And, in addition to the IBM PC, Smartcom II is also available for the IBM Personal Computer XT, COMPAQ Portable, Corona Portable PC, Columbia MPC, DEC Rainbow 100, Xerox 820-II, and Kaypro II personal computers.*

Backed by the experience and reputation of Hayes. A solid leader in the microcomputer industry, Hayes provides excellent documentation for all products. A limited two-year warranty on all hardware. And full support from us to your dealer.

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Hayes Microcomputer Products, Inc., 5923 Peachtree Industrial Blvd., Norcross, GA 30092. 404/441-1617.

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Save New York

creative computing
SOFTWARE PROFILE

Name: Save New York

Type: Action

Author: Joe Jetson

System: C64, IBM PC, and PCjr

Format: Cartridge or disk

Summary: Fast and furious action; very challenging.

Price: $29.95

Manufacturer:
Creative Software
230 E. Caribbean Dr.
Sunnyvale, CA 94089
(408) 745-1655

Well, maybe so, but not from the kind of monsters that inhabit the screens of *Save New York* from Creative Software.

After a title screen from which you select one- or two-player mode, a stylized silhouette of a group of skyscrapers appears along with two subways and a network of sewers beneath street level. Waves of giant, building-eating alien mutants start to descend upon the city. Occasionally, one will lay an egg which falls to the ground and hatches into a subterranean "mutant junior." This malevolent creature roams the subways and sewers and, if you don't catch it in time, starts to eat building foundations thus causing a great deal of damage.

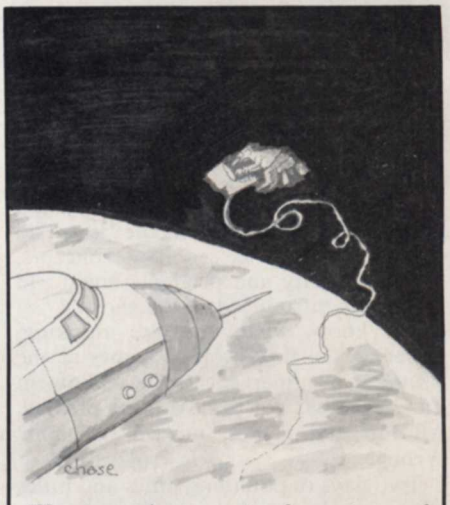
Your job, of course, is to save New York by shooting down both the airborne and underground mutants before they eat the entire city. You maneuver with a joystick; the button fires your laser cannon. While the aliens don't shoot at you, you must be careful not to crash into a building or get run over by a subway train. Moreover, you have only a limited amount of fuel although it may be replenished by intercepting a fuel parachute dropped by obliging supply planes.

In the two-player version, both players are active on the screen simultaneously, so the game can be played cooperatively (for big scores) or competitively. When you have killed all of the mutants in a wave, you advance to the next difficulty level. The game ends when you have used all three of your fighters.

Flying mutants are worth 20 points each; eggs, 50 points; and underground mutants, 90 points. You also get 10 points for each building that remains intact at the end of a round. You are awarded an extra fighter for each 1000 points.

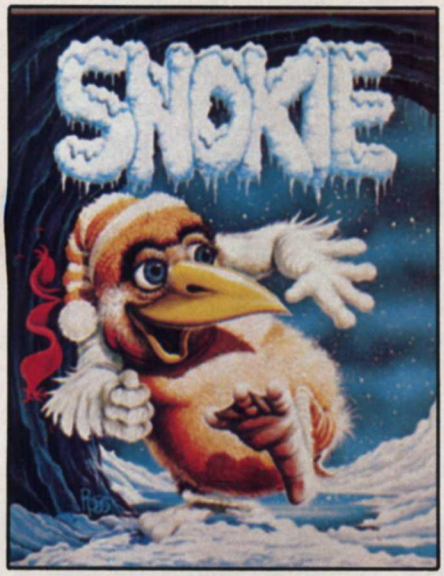
The graphics are colorful, the action fast, the controls responsive, and the sound effects noisy. All of our playtesters found the game to be a real challenge. Rarely did any of our players get beyond the third level, but when they did, it was with a real sense of accomplishment and exhilaration. END

CIRCLE 466 ON READER SERVICE CARD



"Houston, we've encountered a most unusual phenomenon!"

COMPUTER GAMES FLOURISH AT CES



World's Greatest Baseball Game

Ken Uston and Arthur Leyenberger

Things are looking up. After seeing a lot of me-too games at the last two CES's, it's nice to see new concepts, some creativity and original thought in the games introduced at the show.

We know what you are thinking. Covering the new crop of games at the Winter Consumer Electronics Show in Las Vegas has got to be a piece of cake. All fun and games, no work. Right? Wrong!

Two days of pounding miles and miles of carpetted pavement is no box of chocolates. Talking with company PR people, a different species of human, is probably the most tiring. You cannot be rude and just walk away from their pitch, but there are typically 30 or more booths that must be covered by the end of the day.

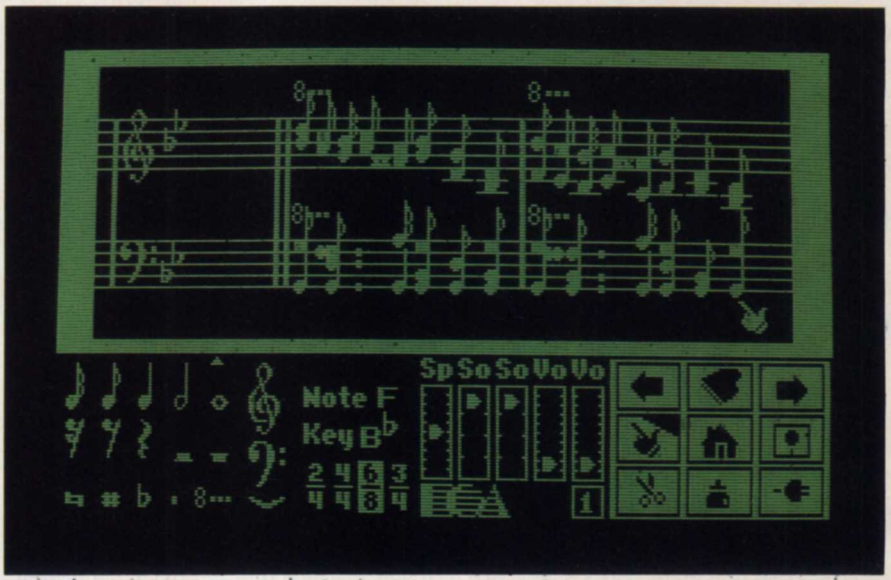
Then there is the 50-pound bag of literature that must be stuffed into your carry-on luggage and brought home.

A great deal of game software was shown at the show. A four-foot stack of 8 by 10 glossies and artist biographies attests to that. Somehow it seems appropriate that in the gambling center of the world, software companies are gambling that computer users will queue up to the software counter and lay out the cash for their latest game. We saw some really great titles that we cannot wait to get our hands on. We also saw some dogs, proving that some software companies still believe that almost anything will sell. The only difference in the execution of this philosophy from just a few short years ago is that now state-of-the-art public relations is required to make it happen. You do not see much baggie-enclosed software these days. But as with any other type of software, swillware still abounds.

With feet still aching from those miles of aisles, we present the following alphabetical (by manufacturer) list of the new game software announced at the Winter Consumer Electronics Show.

The END of DINKETY-DINK.

Announcing the first computer music program that actually sounds like music.



LET'S FACE IT. Up till now, music programs for your home computer have all sounded, well, pretty lame. There were the ones that resembled little electronic music boxes, remember? And then there were those that sounded like so many burps.

Enter Music Construction Set.™ It's the first music program that really makes use of the power of that machine you've got. If you're a serious student, this means you'll be able to work with an intricacy and range of sound quality you've never heard before on a computer. And if you know nothing about music, you'll find something even more important. Namely, that this thing is simple enough to be a lot of fun.

Take a good look at this screen because it, you, and a joystick are the whole story here.

That's you at the right end of the staff of notes – the little hand. Move the joystick, and you move the hand. Use it to carry notes up to the staff. Lay in rests, signatures, clefs, then point to the little piano in the lower right and listen, because you'll hear the whole thing played back.

Move those little scales in the middle up and down to vary the music's speed, sound quality, and volume. Use the scissors to cut out whole measures, then use the glue pot to paste them in somewhere else. Got a printer? Great. Print the score out and show it off to your friends.

But what if you're not up to writing your own stuff yet? No problem. There are twelve pieces of music already in here, from rock 'n roll to baroque. They're fun to listen to, and even more fun to change. (Apologies to Mozart.)

The point is, the possibilities are endless. But if you're still skeptical, visit your nearest Electronic Arts dealer and do the one thing guaranteed to send you home with a Music Construction Set in tow.

Boot one up. Point to the piano. And listen.

NOW AVAILABLE FOR ATARI HOME COMPUTERS

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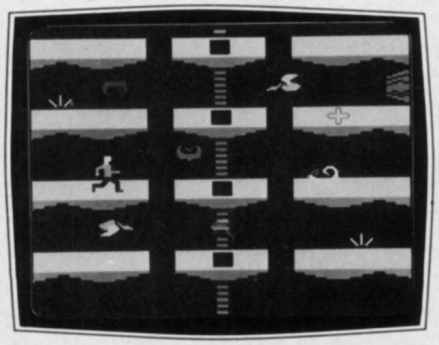
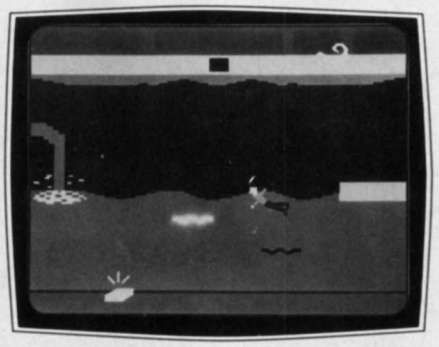
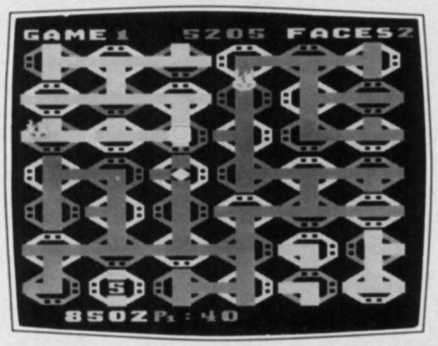
MUSIC CONSTRUCTION SET is now available for Apple II, II+, IIe, and Commodore 64 computers. The Apple version, with a Mockingboard, plays chords of up to six notes each. The Commodore version plays chords of up to three notes each. Apple is a registered trademark of Apple Computer. Commodore is a registered trademark of Commodore Business Machines, Inc. For more information about Electronic Arts, write us at 2755 Campus Drive, San Mateo, CA 94403 or call (415) 571-7171. **For a free catalog, send a stamped, self addressed #10 envelope.**



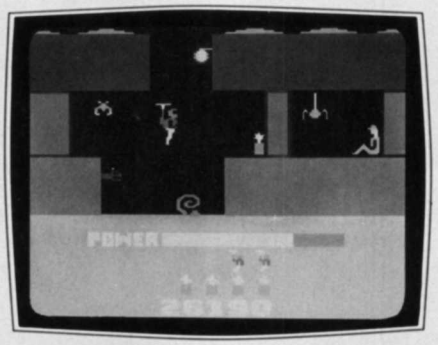
Pitfall II



Pitfall II



Zenji



H.E.R.O.

Activision

Activision continues to cater to the home computer market. Translations of their popular VCS games will be appearing for the Commodore 64, Atari computers, Coleco Adam, Colecovision, and even the Japanese MSX line of computers. The initial titles to be adapted to the home computer market are *Pitfall, River Raid, MegaMania,* and *Beamrider. River Raid* and *Kaboom!* have already been released for the Atari computers.

In addition, Activision announced four new original titles that will be appearing in various game and computer formats throughout the year. *Pitfall II* is the sequel to David Crane's hit, *Pitfall.* The adventures of Pitfall Harry continue as he searches for the famous Raj Diamond.

Pitfall II has a cavern which is eight screens wide and 28 levels deep. The music, in three-part harmony, plus percussion, is impressive.

Rumor has it one guy was at the booth playing *Pitfall II* for seven straight hours. No question—the game is going to be a hit.

Activision showed their first original game for the Atari computers (*Zenji)* and for the Commodore 64 (*Baloony Bin).*

Zenji is a maze game, built around an Eastern meditation theme. We preferred *Baloony Bin,* which has a cute game theme and nice sounds and graphics. The player is a night watchman in a toy factory in which things go haywire. The toys have escaped, balloons blow up by themselves, and a wind-up toy runs around and disrupts things. The player's job is to get things back in order by turning off valves and picking up toys.

Other games for the VCS include *Beam Rider,* a fine simulated 3-D shooting game which first came out for Intellivision, *H.E.R.O.* (a combination adventure and shoot-'em up), and *Private Eye,* a tongue-in-cheek mystery adventure that takes place in a maze of city streets.

Adventure International

Adventure International, the Longwood, FL software manufacturer headed by industry veteran Scott Adams, has a long-term licensing agreement with Marvel Entertainment Group. Adventure International will create and market a series of at least twelve home computer graphic adventure games featuring the entire Marvel Universe.

"By tying the software together with the highly collectible Comic Super Heroes, such as the Hulk, Spider-Man, and Captain America, a cult following is certain to develop," said Adams.

Amiga

Amiga showed a bargain basement line of games for the Atari VCS, in which we could–for the price of a single cartridge—buy from their Power Play Arcade series and get three to five games.

- Arcade 1 consists of three 3-D games, called *Genesis, Ghost Attack,* and *Havoc.* You get a pair of 3-D glasses as well. The 3-D effect was a bit dismal.
- Arcade II is a series of games, all in one cartridge, including *Ego Mania, Scavenger Hunt, Galleon's Gold, Word Zapper,* and *Gopher.*
- Arcade 3 includes some familiar old names, such as *Dragon Fire, Demon Attack, Fast Foods, Star Voyager,* and *Cosmic Swarm.*
- Arcade 4 contains *Atlantis* and *Cosmic Ark.*

Atari

Games from Atari were strictly arcade titles from their game publishing division, Atarisoft. Seven titles were showcased: *Pole Position, Ms. Pac-Man, Moon Patrol, Galaxian, Jungle Hunt, Joust,* and *Battlezone.*

The games are available for a wide variety of computers, including the Commodore 64, Vic 20, Apple, TI 99/4A, and IBM PC.

We couldn't believe the graphics of some of these games for the Vic 20 with its limited memory. The reason: most of the cartridges are 16K chips.

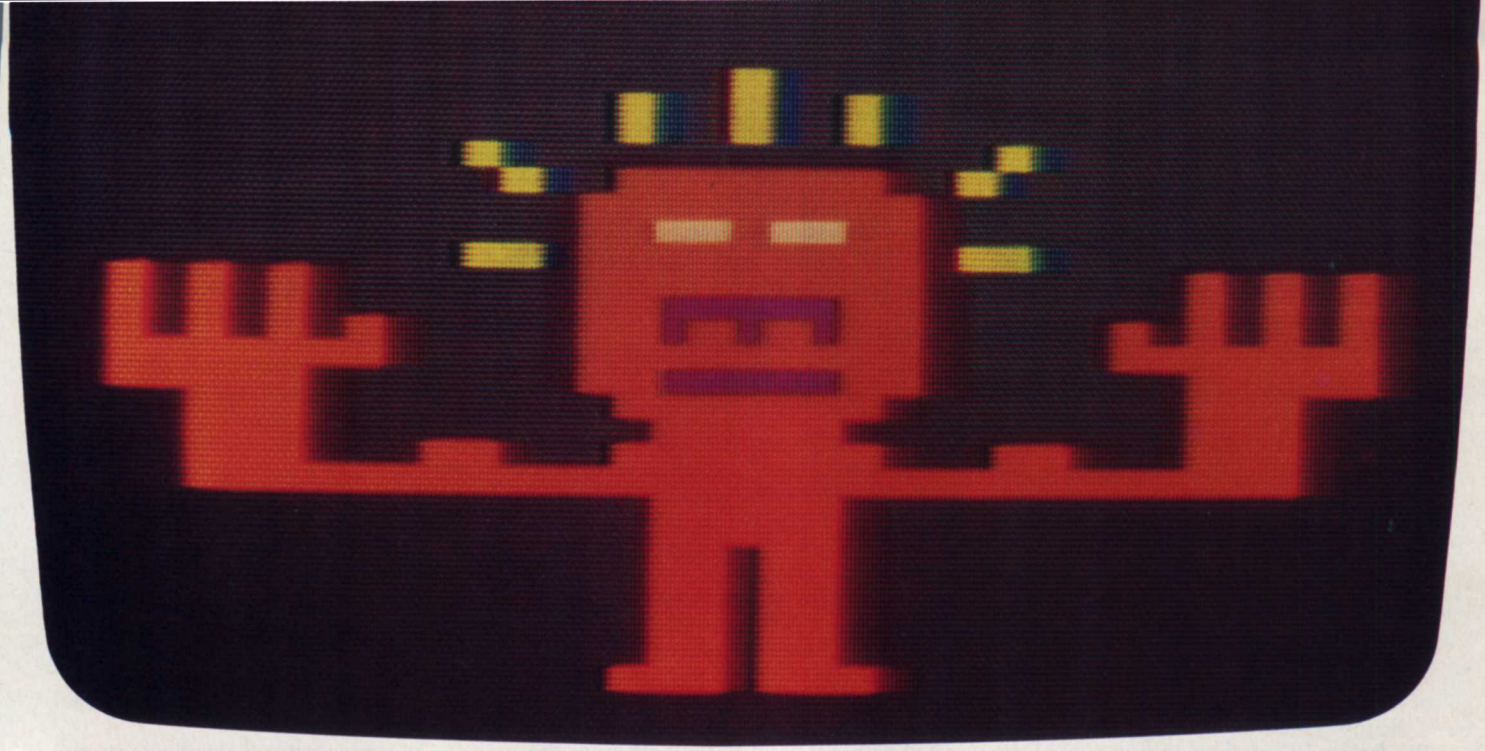
Atarisoft did a good job. The translations are accurate, and the graphics were given painstaking attention. The big question: do people still want to play these games?

Avalon Hill

Avalon Hill showcased *Tournament Golf* for the Apple II. You line up shots with the cursor, and you see a little animated man, hacking away. The computer displays the break of the green, and in longer shots, you must take into account the wind indicator of the game. Both an amateur and a pro course are available for play.

Also from Avalon:

- *Jupiter Mission 1999,* an interactive space fantasy adventure, that comes on (count 'em) four disks.
- A computer version of the popular board game Diplomacy, with stunning graphics, maps of Europe, and everything else you need to be an international diplomat.
- Two Atari VCS cartridges, *Shuttle Orbitor* and *Out Of Control.*
- *T.A.C.* (Apple, Atari, IBM, Commodore 64) stands for Tactical Armor Command, a one- or two-player game of World War II armored combat. You control individual tanks, anti-tank guns and infantry squads.
- *Facts in Five* (Apple, Atari, IBM) is a new game of knowledge for the whole family. It is a race against time as you try to come up with the answers in this trivia-type game.
- *Space Station Zulu* (Apple, Atari) is a humorous strategy game of space sta-



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(For more information on Infocom games contact: Infocom, Inc., P.O. Box 855, Garden City, NY 11530.)

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The next dimension.

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CIRCLE 136 ON READER SERVICE CARD

tion defense. The plot is rather revolting: you are defending the space station against an army of larva-stage lifeforms. Yecchhh!

• *Fortress of the Witch King* (Apple) is the new fantasy title in which your quest is to find the Arch Ruler and slay him. By this deed you will gain the orb, scepter, and crown and free the land from his thrall.

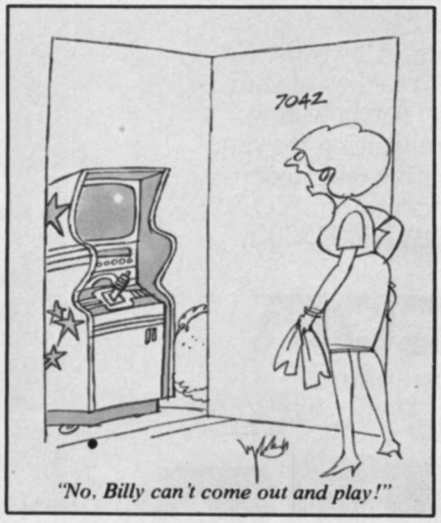
Broderbund

Broderbund, a consistent producer of top games, didn't show any new games. They had copies of their two most recent games, *Spare Change* and *Drol*, and talked about, but didn't show, a new offering called *Mask of the Sun*, a text adventure, for the Atari and Commodore computers that has already done well in the Apple format. The player takes the role of an archeologist adventurer, and treasure hunter in search of an ancient artifact.

Kathy Carlston, one of the three Broderbund Carlstons, told us that their previously announced plans of marketing games for the Atari VCS have been cancelled. It's too bad. We saw a sneak preview of a pinball VCS game they were working on. The graphics were as good as the Atari computer version of *David's Midnight Magic.*

Many of their titles are being released for the Commodore 64. *Spare Change* takes place in an arcade. Your task is to stop video game characters on the lose trying to collect enough tokens for retirement. *Serpentine, Sea Fox, Operation Whirlwind,* and *Matchboxes* are also now available for the Commodore computer. *Lode Runner* is now available for both the Commodore and the IBM PC.

It appears that Broderbund is putting more emphasis on educational and business software. Their most popular package in this market, of course, is *Bank Street Writer*, the best-selling word processing program, available for everything from the Commodore 64 to the IBM PC (and PCjr.)



"No, Billy can't come out and play!"

CBS Software

CBS Software showed about twenty-five new games, many of them with imaginative themes. Among the most interesting:

• *Murder by the Dozen* (Apple, Commodore, IBM), a game that allows players to put their powers of logic and deduction to the test in an attempt to solve a murder mystery. The sleuthing may be done alone, or against up to four rival detectives or in teams.

• *Webster: The Word Game* is sort of an alphabetic Space Invaders. It's a children's game at its lowest level and an adult challenge at higher levels. Players are presented with a word from which key letters have been deleted. As the word descends the screen, players move a pointing hand to select letters to fill the blanks. The objective is to complete the word before it reaches the bottom of the screen.

• *Match-Wits* is a variation of the TV game, "Concentration." As players make successful matches (such as, Paul Newman with "Cool Hand Luke," Salt Lake City with Utah, etc.) portions of a hidden picture are uncovered. The first player to solve the puzzle wins.

• In *Weather Tamers,* the players, looking at a weather map of the U.S., try to affect the weather–to make it rain or snow more, or to cause more sunshine. Players represent a region on the map and must try to create weather conditions to satisfy the population of that area.

• In *Timebound,* we are trapped somewhere in time. Hints are given about historical events so that the players can determine the time period in which the man is trapped.

• *Musical Madness.* Players create movie scenarios by selecting props, characters (such as a herd of elephants or a villain) and even use special effects. Players also score their "movie" by selecting from dozens of available theme songs.

Coleco

Lots of us were waiting to see what Coleco would do with their license for *Dragon's Lair,* the first of the coin-op laser disk games. We'll have to wait some more. The game is still in pre-production and, according to a Coleco spokesman, "the format is still up in the air." We were shown screen shots that looked quite similar to the coin-op version. We shall see.

To follow up on the product that overshadowed Adam last Christmas, Coleco told us they are coming out with a video game, called, you guessed it, *Cabbage Patch Kids.* We get the feeling this is only a general concept at this point.

Coleco showed a line of "Super Games," which come on game packs which we are told have up to 16 times more memory than their standard game cartridges. This allows for more elaborate graphics and more game screens. (The first one of this series is *Buck Rogers,* a fine space shooting game, which is included with the Adam).

Among the Super Games demonstrated were:

• *Subroc,* a sea-shooting game with ten levels, daytime and twilight scenes, and scrolling messages across the bottom of the screen.

• *Wargames,* a strategy and action game with eight skill levels and a controller overlay. As in the movie of the same name, the object is to defend the U.S.A. from all-out thermonuclear war.

If Coleco delivers all they have promised, there will be an enormous library of games for the Adam, including a Best Of series, each contained on a single Super Game Pack (i.e., The Best of Broderbund, The Best of Electronic Arts, Synapse, Sirius, and so on.)

Commodore

Commodore showed a ton of software; new games were only a portion of it.

A highlight of the show was Commodore's *Soccer* for the Commodore 64. When we first glanced at the screen, we thought we were watching a soccer game on TV. The players swing their arms when they run, their shoes are visible, and the goalie jumps up and blocks the ball with his stomach. The ball casts a shadow, and when kicked, it bounces.

This is the best soccer game we have seen, bar none. In fact, we will even go out on a limb and say this game has the most authentic graphics of any home computer sports game that we have seen.

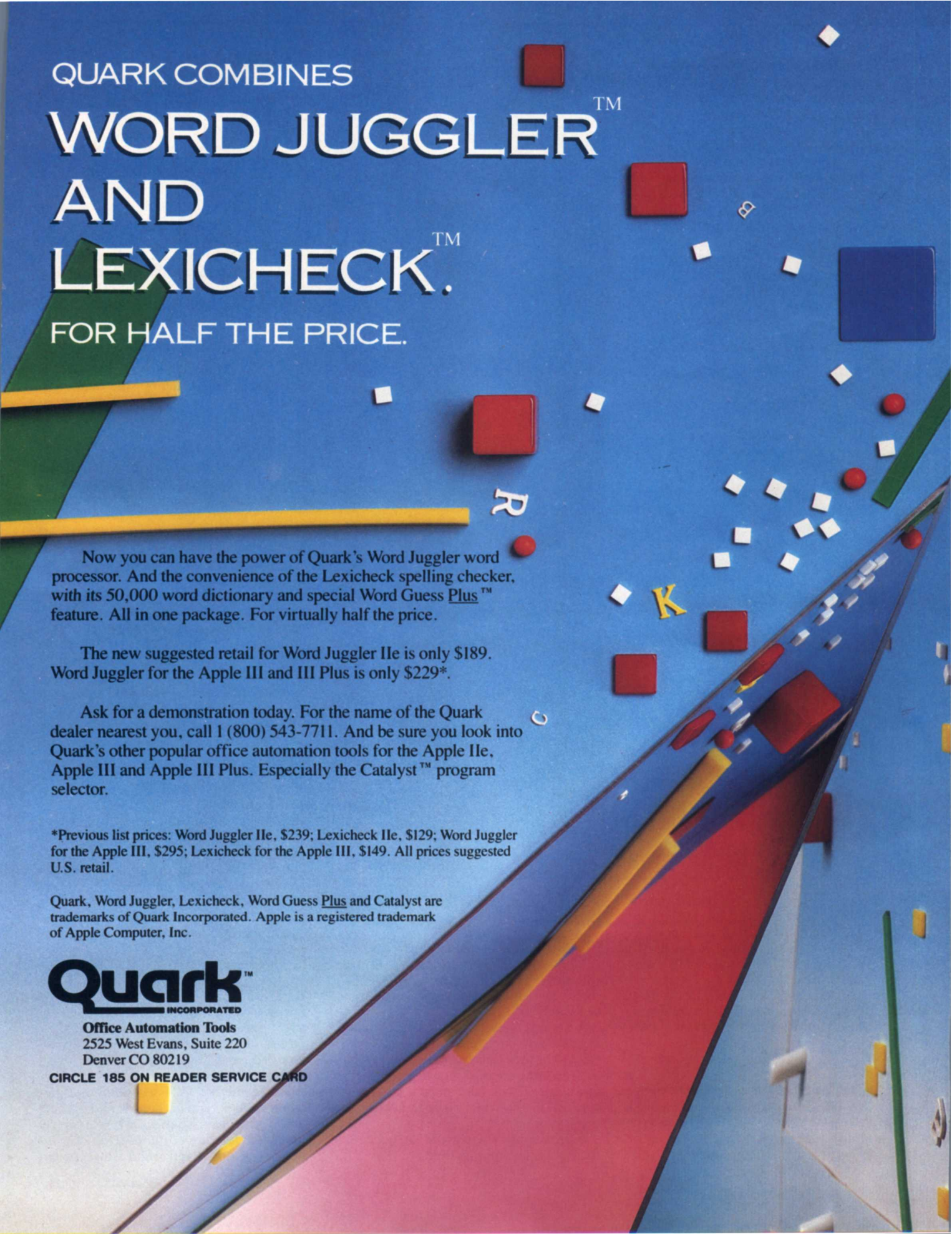
A Commodore spokesman says that they're planning baseball and football games of the same quality. Here's hoping.

Other new Commodore games included:

• Two talking games for the Commodore 64, both arcade adaptations: *Gorf* (the best home version of this game we've seen) and *Wizard of Wor.*

• A Commodore 64 version of the balloonish coin-op game, *KickMan.* The graphics are surprisingly close to Bally Midway's arcade version, probably because Commodore did this game (and others) jointly with the coin-op manufacturer.

• Other arcade adaptations, including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Lazarian and *Solar Fox.*

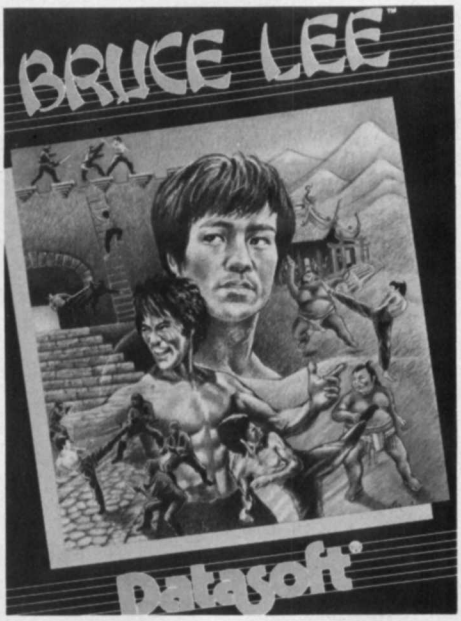
• *Viduzzles,* a jigsaw-type puzzle, in which the player uses a cursor to assemble from 25 to 50 "pieces" to form a clown.

Creative Software

Creative Software announced a new game called *Save New York.* For the Commodore 64 ($34.95), it is a game in which city munching monsters from outer space have dropped in on New York and are gobbling it up. Your mission is to save the Big Apple by flying around in your space ship and shooting down the aliens.

Datamost

Datamost continues to be "the most out of their minds," as their ads proclaim. In their ads, Datamost President Dave Gordon wears one of those little arrows that looks like it's going through his head. (*He gave me one and I wore it until somebody swiped it from me at the Coleco press conference.—KU)*



Datamost has about a dozen games for various computers coming out in early 1984, but didn't show them. As Dave told us, "Our philosophy is not to show new games. We're showing existing games."

They demonstrated their fairly new *Mr. Robot,* a blaster of a climbing game, which also allows you to build your own structure.

Datasoft

Datasoft licensed the character rights for the TV show "Dallas" and showed *Dallas Quest.* The player is a detective who must outsmart crafty J.R. Ewing in his quest for a map revealing the location of a multi-million dollar South American oil field.

Also from Datasoft:

• *Bruce Lee,* in which the player, as the late martial arts expert and film actor, makes his way through a series of fortress chambers, kicking every step of the way.

• Several arcade adaptations, including *Nibbler* (a maze chase), *Juno First* (a space blaster), *Genesis* (a scorpion-fighting-venomous-spiders-shoot-'em-up), and *Lost Tomb* (the player battles for survival in a journey through a 91-chamber Egyptian tomb).

• *Mancopter*—we steer a helicopter through intricate playfields.

• *Meridian III*—a simulated three-dimensional space voyage (Atari, Commodore 64).

Electronic Arts

Electronic Arts had their usual classy display. Most exciting was a new game called the *Seven Cities of Gold* by Ozark Landscape, the folks who brought you *M.U.L.E. Seven Cities* is a role-playing simulation of the 16th century Spanish conquistadors. After outfitting a ship and hiring a crew, you explore the new world by navigating the oceans, sending out exploration parties, and establishing missions. As with most Electronic Arts games, *Seven Cities* has depth and can be played at whatever level suits your mood.

As incredible as it seems, Ozark outdid themselves. Although the demo version we played was not yet complete, it would be a success even if it were released in its unfinished state. *Seven Cities* was clearly the best game introduced at CES and will be a strong contender for Game of the Year. It will be available for Atari and Commodore 64 computers during the first quarter.

Another new game introduced by Electronic Arts is *Skyfox,* a flight simulation and strategy game for one player. Available first for Apple and Commodore 64 computers, *Skyfox* puts you in the cockpit of a high-tech flying machine. Your goal is to save your colony from the invaders who do battle with you in the air and on the ground. *Tesseract Strategy* is another newly announced title. It is a science fiction strategy game for the Commodore 64 in which one to three players must compete with ancient powers for control of the galaxy.

Other welcome news from Electronic Arts is that eventually all of their titles will be available for most machines. Titles originally appearing for Apple, Atari, and Commodore are migrating to the other systems. Also, the IBM PC, XT, and PCjr will be supported in the near future. Titles coming for the PC are *Pinball Construction Set, Music Construction Set, Hard Hat Mack, Archon,* and *Dr. J and Larry Bird Go One-On-One.*

The game designer of *One-on-One* studied films of basketball players Larry Bird and Julius Erving ("Dr. J") to create this imaginary match between the two superstars. He gathered statistical tables of their shooting percentages—guarded and unguarded—from every part of the court.

The game has a 24-second-shot clock, a game clock, a scoreboard, and a backboard that even shatters when a player makes a ferocious dunk. *One-On-One* has marvelous detail, right down to Dr.

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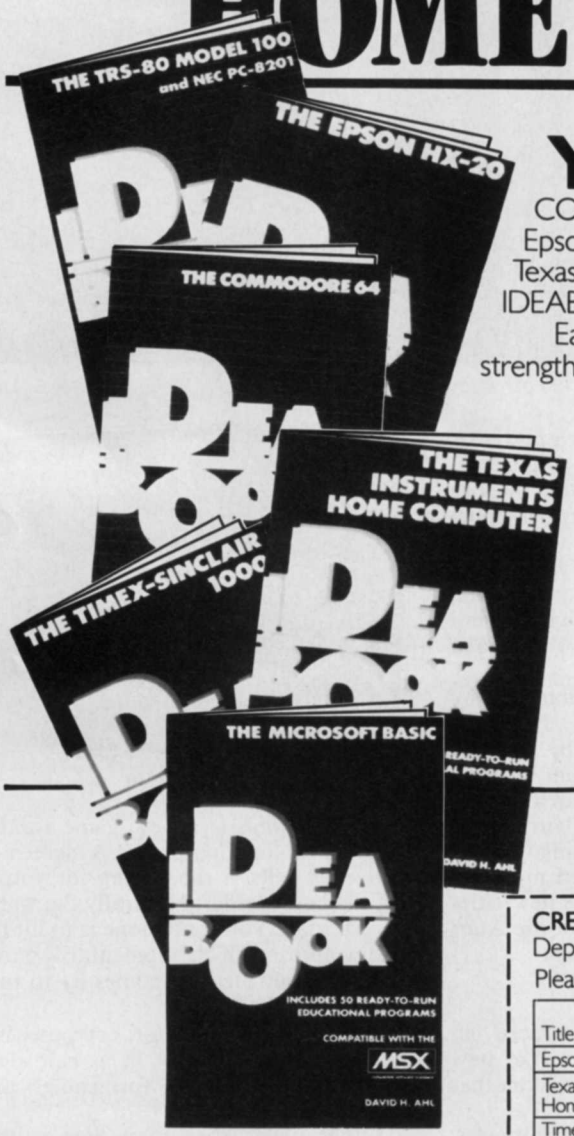

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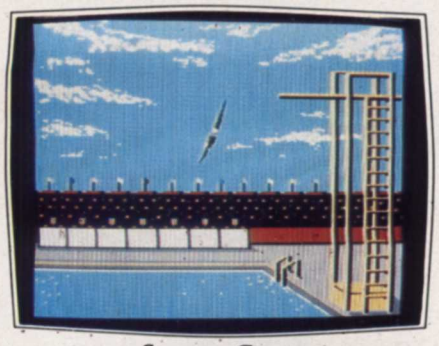
J's 360 slam dunk. Watch out for this one.

Epyx

Epyx introduced *Summer Games,* a sequence of Olympic events (e.g., diving, swimming, rowing, cycling, archery) with fine graphics. The player first selects the country he wants to represent as various national flags are displayed on the screen.

The national anthem of the selected country plays, followed by an Olympic ceremony, in which a runner lights the Olympic torch, as doves fly by.

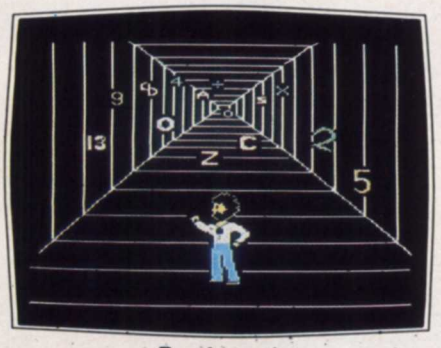


Summer Games

The diving event is particularly effective. The diver's performance, controlled by the player, is evaluated by six judges, who hold up cards, ranking the dive on a scale from 0 to 9.

It is going to be difficult to be objective about one game shown at the Epyx booth, called *Ken Uston's Puzzlemania, (because I, with two other fellows, designed it—we call ourselves Fun And Games. But I'll try—KU).*

Puzzlemania is a series of graphics puzzles which the player must solve by using logic, concentration, observation, and sound recognition. He must also figure out the overall puzzle, which is to find his way through all the puzzles, to get to the end. *(I think it's pretty good; we'll see what you guys think, real soon.)*



Puzzlemania

Other Epyx games include *The World's Greatest Baseball Game.* The game has complete playing statistics from the National League built-in. The player picks a team and can play either as a player or as a manager and watch the action.

In *Fire!,* the player becomes the fire chief responsible for deploying personnel and equipment in a frantic attempt to save lives and equipment. Such variables as wind direction and speed, perimeters, and the availability of firefighters and equipment influence an uncertain outcome.

The final new game announced by Epyx was *Mission Impossible.* Here, the player must save the world by preventing the infamous Elvin from making good on his threat of nuclear annihilation. You must penetrate Elvin's database installation by avoiding enemy robots and interpreting coded messages and computerized hints. The new titles from Epyx will be available for the Atari and Commodore 64 computers.

Uston and Ahl: Uston models his birthday present from Ahl.

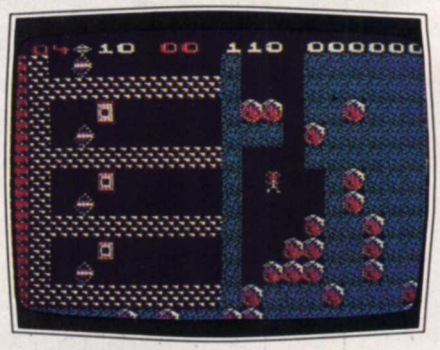
First Star Software

First Star Software introduced an imaginative maze game with a new twist, called *Boulder Dash.* It is another show-stopper.

There are 16 *Boulder Dash* mazes. The player digs around walls of rock, searching for jewels. If he collects enough of them, an escape tunnel appears, and he progresses to the next screen.

The screen scrolls horizontally, and each successive screen introduces addtional characteristics that the player must figure out in order to complete it.

A First Star spokesman told us they are hoping *Boulder Dash* will be the *Miner 2049er* of 1984. We think it has a shot. *Boulder Dash* will first be available for the Atari and IBM PC computers.



Boulder Dash

Panic Button is a new game for the TRS-80 Color Computer. A screen of conveyor belts is the setting for you to fill the boss's order. Naturally, he wants it yesterday. Your only hope is to hit the panic button which momentarily stops the belts, but the boss comes by to turn them on again.

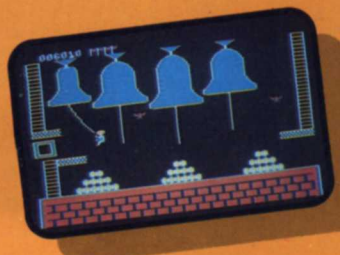
Rent Wars for the Atari computer is a game with which most of us can identify. The race is for furnishings and apartment rentals.

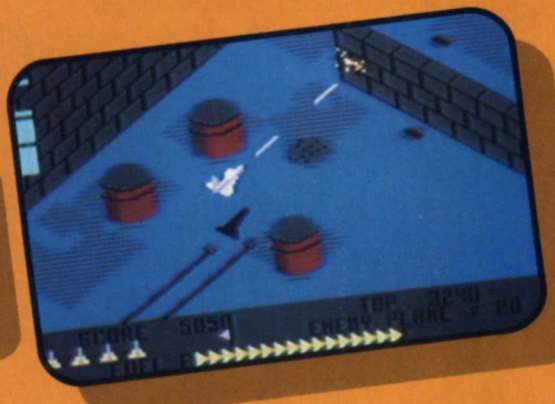
Other news from First Star is that *Astro Chase, Bristles,* and *Flip and Flop* are available for the Commodore 64 computer.

HesWare

HesWare had Minnesota Fats at their booth, and, guess what? They introduced a game called *Minnesota Fats' Pool Challenge.* The game is simple to play; the player aims with a cursor and determines the speed of the cue ball using a little bar that appears on the screen. *Pool Challenge* has three game options.

ZAXXON FOR THE C-64!





Quasimodo
Quasimodo knows who stole the crown jewels. He even knows where they are, but the soldiers just won't leave him alone! This multi-screen arcade adventure is a great combination of skill and strategy.

Commodore 64 disk & cassette

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Other new HesWare games shown were:

- *Rootin' Tootin',* a playable maze game adapted from a popular Japanese arcade game.
- *Ghost Manor and Spike's Peak,* two games in one package, and one of several multiple game offerings at the show.
- *Hes Games 84,* a well-animated series of athletic events, including archery, diving, running, and weight lifting (the weight lifter smiles and nods and shakes his head if he fails).
- *The Pit,* an arcade game adaptation, with a Dig Dug-type subterranean theme.
- *Music Box,* sort of a combination of an arcade and adventure game. The player must find pieces of a music box which are scattered about the terrain, piece it back together, and play the theme which, of course, will destroy the forces of evil in the universe.

Home Computer Software

Home Computer Software introduced:

- *Kids Say The Darndest Things To Computers,* featuring a "conversation" with Art Linkletter. The game is based on Linkletter's best-selling book of the same name.

The player responds to a series of questions: if nothing is entered, the computer makes up a reply. Then some music plays, and a story appears on the screen, personalized for the child.

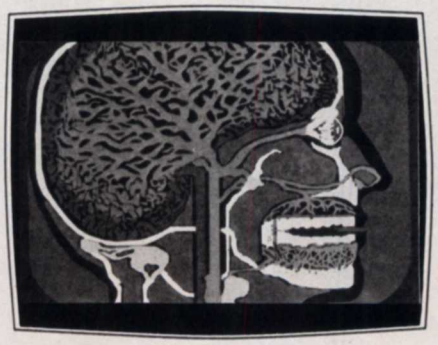
- *Plaqueman,* a Pac-Manesque maze chase, with a dental hygiene feature. The player maneuvers a toothbrush around a maze, making yellow teeth white.

- A golf game, endorsed by golfer Tom Weiskopf, with many options not found in other golf games. The Computer keeps track of players' handicaps and generates random wind, rain, and pin placement. This is a strategic golf game, played on a keyboard, as opposed to the action-type golf games we have seen for the video systems.

Imagic

Imagic, as most of you know, has been having its troubles. Its booth seemed a bit Spartan compared to earlier shows. Chairman Bill Grubb told us, "The game market is saturated. We're concentrating on introducing products for the PCjr and Adam."

For the PCjr, they previewed their best-seller, *Demon Attack,* as well as *Microsurgeon, Football,* and *Baseball.*



Microsurgeon

Three new games for the Atari were also announced. *Quick Step* is an unusual game in which the goal is to pig out and "claim" as much of the scrolling food as possible by landing on it. Then, you climb to the top of the table and try to bounce the check for the meal into your opponent's plate, while dodging uninvited guests. As we said, strange game. In *Wing War,* you flap your wings and fly. Your travels take you past caves, waterfalls, precarious ledges in the sky and falling stalactites. Capturing dragon eggs, avoiding the griffins, and breathing your fiery breath on unsuspecting enemies add to the excitement.

Wing War

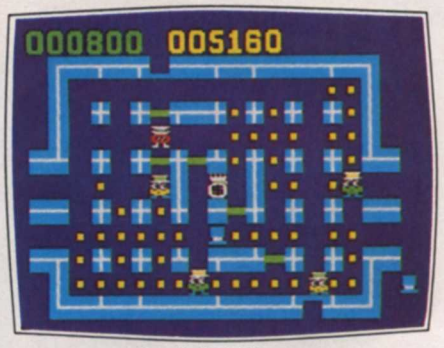
The other new title for the Atari is *Laser Gates.* It seems that computers have been programmed to blow up the universe and your job is to maneuver your ship through dangerous laser gates to find and destroy the berserk computer.

Mattel

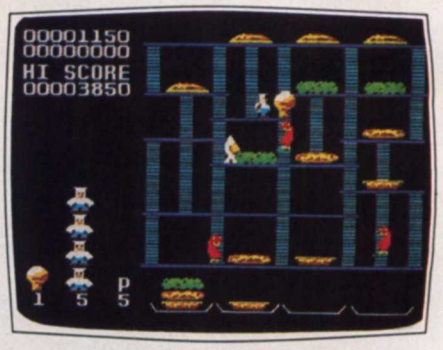
What's CES without a new fantasy role-playing game for Intellivision from Mattel? This time the game is called *Tower of Mystery* (but that may change—it's only a working title).

Mattel also showed:

- A conversion of their well-received cops 'n robbers game, *Lock 'N Chase* for the IBM PC (making three IBM games from Mattel—the other two are *Burgertime* and *Night Stalker*).



Lock 'N' Chase



Burgertime

- Two new games for Apple: *Heavy Artillery,* a strategy action game, and *Pirates Of The Nile.*
- *Illusions* for Intellivision. The player is split into multiple images and must try to become whole before time runs out.
- *Thunder Castle,* an adventure strategy game, with enchanted forests, dragons, sorcerers, and the rest.
- Mattel finally came out with a one-player baseball game after all these years. It's called *All Star Major League Baseball,* a game that corrects some of the shortcomings of its famous predecessor. Players now can tell if a batted ball is a grounder (it bounces) or a fly (there's a shadow). And it is made so that players can slide into home, which apparently is important to someone.

Go For The Gold is advertised as the "Official Videogame Of The 1984 Win-

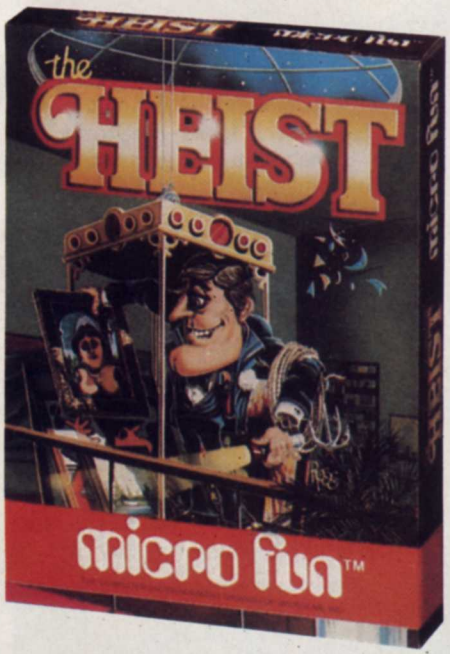
ter Olympics." It has four rather unexciting events: skiing, boxing, hockey, and basketball. (The skiing and boxing looked about the same as the renditions of these sports from Activision a few years back.)

Mattel has had the Burgertime franchise for quite a while (forgive me). They introduced their newest version, for ColecoVision, which looked better than their VCS attempt, and not as good as their IBM PC version.

The bad news is, that unless you have purchased a special controller, you still must play the new Intellivision games with their infamous disk controller.

Micro Lab

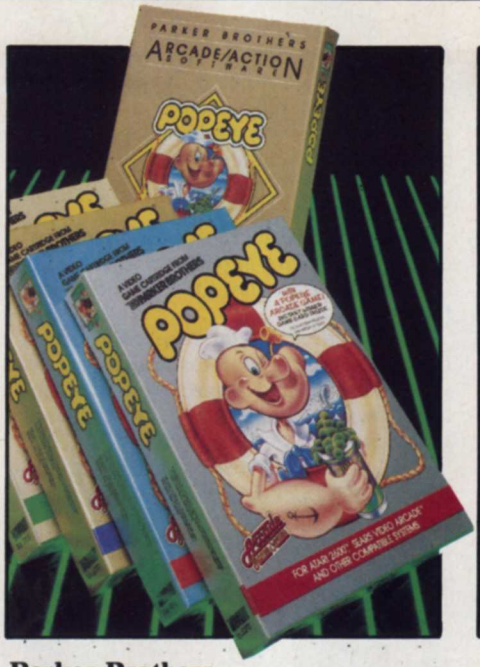
Micro Lab showed *The Heist,* an espionage game in which a spy is in a museum looking for microfilm. He grabs art as he passes it and must maneuver through 96 booby-trapped rooms. *The Heist* is a climbing game, in which the spy ascends escalators, leaps from moving platforms, and runs into brick walls.



The game is available for Apple, Atari, Commodore 64, and IBM PC computers.

Also from Micro Lab is *Scraper Caper,* a sequel to the mega-hit, *Miner 2049er.* Bounty Bob is now a firefighter, inside a burning hotel, trying to avoid getting fried or falling through collapsing stairways. The simulated 3-D walkways of this game remind us of the Atari coin-op game, Crystal Castle.

The other new MicroLab game for the Apple, Atari, IBM PC, and Commodore 64 computers, is *Death in the Caribbean.* A hi-res graphic adventure, it provides more than 100 different screens for your adventuring pleasure.



Parker Brothers

After successfully marketing such game greats as *Frogger, Q-Bert,* and *Popeye,* Parker Brothers is still coming on strong with several new titles.

Star Wars is an amazingly authentic translation of the arcade version. The graphics achieved on the VCS are nothing short of spectacular. Versions (all good) were also shown for the Atari 5200, Atari computers, ColecoVision, and Commodore 64.

Gyruss is outstanding because of the fine music and the three-dimensional effect created by the waves of aliens, who attack from a full 360-degree range.

Parker also introduced an original game, *James Bond.* Each of four adventures represents a key scene from a Bond movie ("For Your Eyes Only," "Moonraker," "Diamonds Are Forever," and "The Spy Who Loved Me." The player must complete all adventures to get his 007 rating.

Prentice-Hall

Prentice-Hall—Reston Division—showed an unusual concept in games from a group of artists who call themselves, Flyghts of Fancie. The games being created by this group are titled *Day, The Middle of the Road Lizard (M.O.R.L), Dolphin's Pearl,* and *Life.*

It was difficult to know exactly what this group is trying to do because there were no games to play. Further, the themes of the games are a bit abstract, to say the least.

We were shown a file clip of computer screens, which did in fact have state-of-the-art graphics, marvelously detailed subtle colors, and futuristic music.

In *Day,* the player is a sky diver floating in an atmosphere of abstract color. The objective? Trying to have a good day, of course.

In *M.O.R.L.,* the player tries to change his life and escape to a better world. The player starts as a dinosaur, evolves into a lizard, and finally a dragon in a crystal spiral. There is a bit of realism to the theme, because if the player stays in the fast lane too long, death by heart attack results (too long in the slow lane causes death by depression).

The Flyghts of Fancie people seem to be on to something. We have the feeling, though, that they're still at quite a preliminary stage in developing their concepts.

Screenplay

Screenplay showed *Pogo Joe,* a Q*bert-type jumping game, with 32 screens and interesting simulated 3-D

graphics. *Pogo Joe* has interesting strategic overtones, because of the random appearance of various types of characters on the screen. (*We rank it right up there with River Raid, which has been my favorite for the past year.—KU*)

Other Screenplay introductions were - *The Institute,* a (good) graphics adventure, that lets the player respond with full sentences, and *Playful Professor,* a cute educational game featuring a moving piece of chalk that not only teaches kids arithmetic, but explains the whys and wherefores of getting to the correct answer.

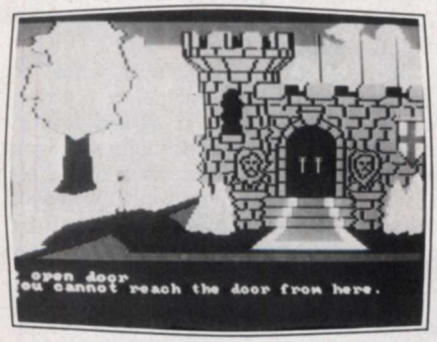
Screenplay had blackjack table set up to highlight a teaching program called *Ken Uston's Professional Blackjack,* their best-selling product that teaches how to beat the casinos at blackjack (*yeah, I had something to do with it. By the way, I was able to play briefly at about half a dozen Vegas casinos during CES and won $3100 before being stopped from playing at the Hilton, Stardust, Sahara, Holiday, and the Dunes.—KU*).

Sega

Sega didn't show anything new at the show. They did announce, however, that the release of their *Star Trek III* will coincide with the opening of the Paramount Pictures' movie, "The Search for Spock" (both companies are subsidiaries of Gulf & Western).

Sierra On-Line

Sierra On-Line was showing some interesting new titles. Their co-founder, Roberta Williams, has come up with yet another adventure game (she's done five). This one's called *King's Quest,* which has animation, enhanced graphics and sound, and simulated 3-D screens. The program accepts entire sentences, and the game is replayable since there are two ways to solve each challenge.



King's Quest

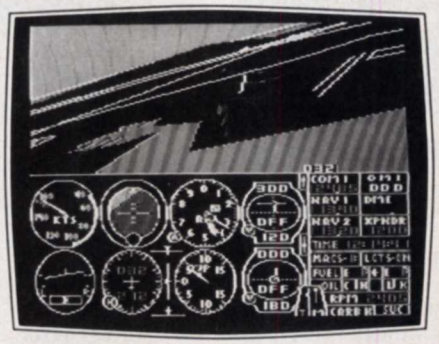
Sierra also introduced a statistical boxing game, called *Championship Boxing,* where the player faces such opponents as Ali, Frazier, Tunney, and Holmes. *The Prisoner* is a strategy game based on the cult classic TV series, "The Prisoner," starring Patrick McGoohan. *Snokie* has a cute game theme and nice graphics. The player faces arctic dangers, such as snow boulders, moving ice blocks, and falling icicles.

Sublogic

Entec, Sublogic Corporation, introduced *Flight Simulator II* for the Apple. (Commodore 64 and Atari versions will follow.)

The original *Flight Simulator* came out in 1979 without color graphics. This version includes an improved instrumentation screen and color 3-D simulated graphics.

The player can look out the front window of the cockpit or the left or right



Flight Simulator II

windows. The screen also displays a zooming radar view. The player can fly out of 80 different airports. Actual landmarks, such as the John Hancock Building and the Sears Tower, are shown on the screen.

We are not pilots, but *Flight Simulator II* seems really authentic—and the graphics are excellent.

Sunrise Software

Sunrise Software, Dallas, TX, made their first thrust into the game market at the show. They introduced *Campaign 84,* an election day game, in which players select critical campaign issues, such as Make Dogs The National Pet and Outlaw All Pink Cars (would that those were the issues of the day). It's a clever strategy game, with many different screens, including the American Flag and a map of the U.S. When the election returns finally come in, the computer tallies them for you.

We also enjoyed their *Gust Buster,* a flight through a colorful amusement park. The player selects a balloon, pumps it up (if he over-inflates, it bursts), and rises into the wind layers overhead. He floats over the amusement park, as the screen scrolls, avoiding such things as parachute rides and fireworks. He lands and sells balloons to the crowds.

Quest for Quintana Roo is an adventure game for ColecoVision. It's a climbing type game, in which the player enters a pyramid and progresses in search of buried treasure through chambers that pose various threats.

Synapse

Synapse had one of the most stunning introductions of the show—*Dimension X*—a 3-D simulation with fabulous effects. The player looks out from the front of a spaceship and gets the sensation of moving back and forth because of rectangular squares that move about on the screen. The effect is totally realistic, right down to the mountains scrolling in the background.

Commodore 64 owners should be very happy with the following news. Synapse is in the process of converting almost all of their titles for your machine. *Blue Max, Necromancer, Pharaoh's Curse, Drelbs,* and *Zeppelin* will all be available soon. Two additional Commodore releases warrant special attention.

Slam Ball could very well be the most exciting pinball game for any micro-

Synapse games on large-screen displays.

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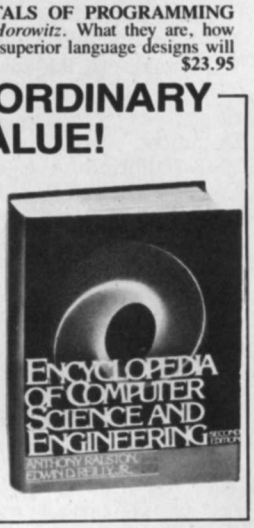

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computer. It takes a different approach to the usual full screen display. Up and down scrolling is used to track the ball and the action. There are four screens worth of bumpers, flippers, and roll-overs. A tilt feature is provided, and two people can play at once with one controlling the ball and tilt, and the other handling the flippers. This game has to be played to be appreciated.

The other game that gets special mention is Synapse's version of *Zaxxon* for the Commodore 64. *Zaxxon* captures the full simulated 3-D effect of the coin-op version. Graphics are easily the best of any of the home computer versions of this classic arcade game, and there is even a fourth fortress that must be penetrated. The 3-D graphics never looked so good.

Encounter is a new Atari game that puts the player inside a tank for a futuristic look at tank warfare. This is a no frills approach to shoot-'em-up game play.

Another new Atari title, *Rainbow Walker,* leaves the world of violence behind and allows you to control a cute little elf. Hopping onto squares—gray ones that turn into rainbows—seems like a peaceful pastime. Lightning, tornadoes and other hazards turn this game into a delightful test of skill.

Synapse also announced a swinging new game for both the Atari and Commodore 64 computers. In *Quasimodo* you are accused of stealing the castle jewels and must elude the castle by swinging from bell to bell inside the bell towers.

Texas Instruments

As might have been expected, Texas Instruments introduced no games at the show for their 99/4A. Their focus was on other types of games, such as hand-held learning devices and children's games, with names like Speak & Math, Speak & Spell, and so forth.

T & F Software

T & F Software showed an imaginative game, *Leafer Madness.* As a caterpillar, you must climb up to the top of a plant to metamorphose into a butterfly. Caterpillars eat leaves for energy, insects get in the way, and you encounter various other impediments. We know it sounds silly, but it's fun to play.

Jet Star

T & F also showed *Spogo,* a Q*bert type game, with fifteen different screens. The player hops around changing the colors of platforms, while avoiding bouncing balls. In *Jet Star,* a shooting game, you are a flying "jet man" named Captain Twinkletoes, who must capture all the minerals in an unfriendly planet while avoiding the enemy.

Thorne EMI

Thorne EMI introduced *Computer War,* a strategy game. The player shoots at aircraft before his bases are bombed. An overall strategy screen shows the location of the bases (for Atari, Commodore 64, Vic 20 and TI 99/4A).

Liberator is a Defender-like scroll to-the-right, shooting game. The player's rocket ship flies over rivers, ships, and bridges, cities and mountains. The goal, of course: to destroy enemy ships.

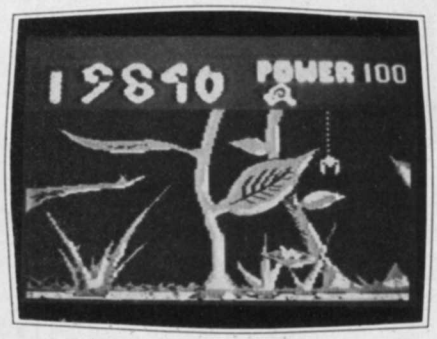
Also from Thorne are two games called *Mini Madness* and *Submarine Commander.*

Tigervision

Tigervision announced several game titles for various computers. The following games are available for Texas Instruments 99/4A, Atari, Commodore 64, and IBM PCjr computers and list for $29.95. Two space theme shoot-'em-ups are *Espial* and *Sky Lancer.* You are an attack pilot flying over a gigantic star ship in *Espial.* In *Sky Lancer,* you are abandoned in space without your ship.

The other new Tigervision game is a demolition derby of sorts. You are in the middle of the action with *Super Crush.* Best avoid the oil spills, flying tires and other cars or you will get caught in a super crush.

If there was any theme of the game offerings at this year's Winter Consumer Electronics Show, it was that all of the great titles are migrating to all of the machines, and companies like Electronic Arts, Synapse, and even Atari, are pushing the limits further out on quality game software. ENC



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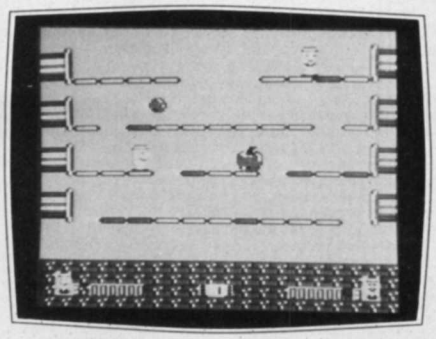

Spogo

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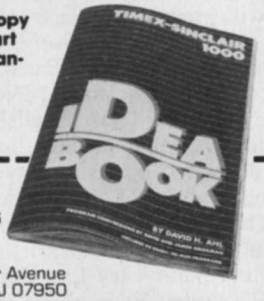

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Structured Programming In Basic

Part 1: Top-Down Basic

Arthur Luehrmann

Why Bother With Basic?

More people know how to write programs in Basic than in any other computer language. Already, 10 million people own computers with Basic as the only built-in language. The number will double in the next year or two. Basic programming manuals outnumber by a wide margin all the rest of the manuals put together. Most of the programs printed in this magazine are written in Basic. About 90% of children who learn to use computers in school learn Basic. Nearly all self-taught programmers are Basic programmers.

If the choice of a natural language depended on its quality, no one would learn English.

Not everyone is delighted by these facts. Academic computer scientists are particularly scornful of Basic. The great Edsger Dijkstra, for example, does not mince words: "It is practically impossible to teach good programming to students that have had a prior exposure to Basic: as potential programmers they are mentally mutilated beyond the hope of regeneration."

Strong words, these. And many would agree. I have heard more than one university professor say that he wished that schools would keep programming a secret, lest they botch the job; instead, wait for the kids to get to college where they can be taught correctly in proper programming languages.

This is a vain hope, of course. It is rather like trying to keep sex a secret until after marriage. No matter what solemn advice is given, the little devils go out and learn for themselves. Computing is fun, as we all know. Computing is available at low cost. Computing can be carried out in the privacy of one's own home. Therefore, neither stern warnings nor learned counsel nor holy scripture will prevent people from learning to do computing.

And, like it or not, that means learning Basic. Basic, after all, is the common tongue of computing today. People learn it for the same reason people in Peoria learn English and people in Paris learn French. Quality is not a consideration. If the choice of a natural language depended on its quality, no one would learn English; it is a hodge-podge of Old Norse, Anglo Saxon, and Norman French. There is hardly a rule worth committing to memory. It is all but impossible to learn, to read, and to write English. If you want quality, try Latin or Esperanto.

Yet we here in this country limp along in English. Our schooling effort is mainly spent teaching kids to read, write, and think clearly in this wretched language. Why do we do that? Because it is there. Because if schools didn't teach proper English, most people would end up illiterate. Basic is like that. It is there too. And, if schools fail to teach proper Basic, the result is inevitable: millions of folks will talk to their computers in "street Basic."

That, alas, is pretty much what we *do* have today. In fact, this unpleasant reality is probably at the root of much of the harsh criticism directed at Basic. If you were a college English teacher who daily faced a hundred students who spelled words any which way they liked, ran all their sentences together, did not know what a paragraph was, had never heard of using blank lines or indentation, and did not know how to organize their ideas, then you would probably feel exactly the same way many computer science instructors feel when they face a roomful of self-taught Basic programmers.

The remedy, however, is not simply to give up on the common tongue and try to stamp it out. That is impossible in any case. Rather, the task is to show people better ways to use the

language they know for expressing their ideas in a well-organized, clear, logical, readable style—in short, to replace "street language" with "proper language."

This article and the three that follow in coming months will describe such a non-mentally-mutilating approach to programming in "proper Basic." A decade of experience has proved that people who follow this approach, no matter what language they use, are successful at writing programs that

- are easier to get right the first time,
- are easier to read,
- are easier to change, and
- are easier to take apart and reuse

than programs written by people who do not understand or practice this method of programming.

Herbert Peckham and I developed the details of the following approach for Basic while writing *Computer Literacy—A Hands-On Approach,* a precollege textbook published by McGraw-Hill in both Apple and Radio Shack versions. Although the book is intended for complete beginners, the main emphasis is on laying the groundwork for a systematic, mature approach to planning and writing programs.

Top-Down Design

There are two major ideas encompassed by the term *structured programming.* One is the use of a small number of *control structures* to handle all problems in program logic. Next month's article will deal entirely with the topic of control structures in Basic. The other main idea, which is this month's topic, is that a well written program should appear to the reader as a hierarchy of modules each one of which is more abstract than the ones beneath it. The programmer should begin with the most abstract description of the problem and then work "top down" to the modules that contain the concrete details.

Those are high-falutin' words, but they have a meaning familiar to anyone who reads a newspaper. In fact, a news story is a model of top-down organization. The headline tells the whole story but gives no details at all. The lead paragraph is only slightly more detailed, each sentence calling attention to some important part of the story. The paragraphs that follow give details that are more and more concrete. The writer and editor work hardest on the headline and lead paragraph. After that, the rest of the story usually follows freely.

A well written program has the same structure, and for the same reasons. The program title should tell the purpose of the program. The lead module—the *main routine*—should briefly state the major actions the computer is to peform. The modules that follow—the *subroutines*—should describe each action in greater and greater detail. The programmer should work hardest on thinking as abstractly as possible about the major tasks the computer must do. While thus working on the main routine, the programmer should avoid getting bogged down in details. Only after the main routine is complete, should the programmer turn to the subroutines and begin filling in the details. If a subroutine grows too complex, additional details should be buried in later subroutines.

A well written program should appear to the reader as a hierarchy of modules each one of which is more abstract than the ones beneath it.

To put it another way, the top-down programming method is a lot like the process of outlining a report you might have to

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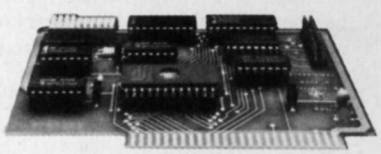

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write. The title tells the purpose. The main headings in the outline tell the major ideas that will go into the report. Each level of subheadings gives more and more details about the headings above it. Good writers begin by thinking hard about the title and the main headings. After they are satisfied with this abstract picture of their report, they begin filling in the details as subheadings. Finally, they write the actual report, which usually flows quickly as a result of the effort spent on planning.

Good professional programmers nowadays do the same thing. They spend the majority of their time planning and designing the program. Only after they are satisfied with the complete design do they turn to the task of *coding*—that is, writing all the detailed statements needed to give full meaning to the plan.

One reason they do this is that their employers insist on it. Research studies have shown that people who follow the rules of structured programming are more efficient programmers than others who are "free-style," "clever," or "creative" programmers. Vastly more important, the programs produced by structured programming methods are far easier to read and maintain by others than are free-style programs. Since software maintenance is the biggest cost in computing today, saving money on maintenance can make the difference between success and failure of a computer application.

These research results are now part of the modern programmer's folklore. It is best summarized in this frequently heard proverb: "The sooner you start coding, the longer the job will take."

A Top-Down Example

The best way to understand the top-down approach to planning is to see an example. The following one is taken from a recent book of ours, *Hands-On Basic for the IBM PCjr,* which is to be distributed by IBM along with their new computer.

Suppose you have a computer that can play musical tones. You want to write a program to play the following song:

```
C  C  G  G  A  A  G
F  F  E  E  D  D  C
G  G  F  F  E  E  D
G  G  F  F  E  E  D
C  C  G  G  A  A  G
F  F  E  E  D  D  C
```

You probably recognize the notes. The song is "Twinkle, Twinkle Little Star." Let's assume your computer has some sort of Basic statement that tells the computer to play a single note for a specified length of time. Let's say the statement is PLAY. PLAY "C", for example plays middle C on the piano.

In my old days as an unreconstructed free-style programmer, I would have solved this problem very easily. I would have gone straight to the computer and started in like this:

```
110 PLAY "C"
120 PLAY "C"
130 PLAY "G"
140 PLAY "G"
150 PLAY "A"
160 PLAY "A"
etc.
```

That would get boring quickly, so I would erase the whole thing and rewrite the program like this:

```
100 FOR J = 1 to 42
110    READ N$
120    PLAY N$
130 NEXT J
140 DATA C, C, G, G, A, A, G
150 DATA F, F, E, E, D, D, C
160 DATA G, G, F, F, E, E, D
170 DATA G, G, F, F, E, E, D
180 DATA C, C, G, G, A, A, G
190 DATA F, F, E, E, D, D, C
```

That indeed is one way to write the program for playing "Twinkle, Twinkle Little Star." Given the PLAY statement, it ought to work. Isn't that the goal of programming?—to get the thing to work?

To make a program easy to understand requires thought and advance planning. Therefore we must begin by thinking not about the program but about the problem.

Well, it is certainly one goal. But what about the ease of reading? What about ease of changing? What about finding and fixing bugs when one makes the changes? These goals are far more important than just getting the program to work by brute force. To make a program easy to understand requires thought and advance planning. Therefore we must begin by thinking not about the program but about the problem.

Look back at the notes of the song. Is there any pattern or order in the notes? Does this song have a particular form or shape? How, in abstract terms, could you describe the form of "Twinkle, Twinkle Little Star."

A little study will reveal that the 42 notes fall nicely into three parts, each with 14 notes. The first and third parts are the same, and the middle part is different. Musicians call this the A-B-A form, and literally thousands of songs have this form in Western music.

```
A-Part: C  C  G  G  A  A  G
        F  F  E  E  D  D  C
B-Part: G  G  F  F  E  E  D
        G  G  F  F  E  E  D
A-Part: C  C  G  G  A  A  G
        F  F  E  E  D  D  C
```

Having made this discovery, it is easy to see how to think about the program to play the song. Instead of worrying about details, such as the actual note values, we should be telling the computer how to play an A-B-A song—this one *or any other.* Here is what we would like to write:

```
100 PROGRAM A-B-A SONG
110    PLAY A-PART
120    PLAY B-PART
130    PLAY A-PART
140 END
```

Unfortunately, most Basics would respond with a bunch of "Syntax error" messages if you tried to run the above program. However, small changes will make it legal. Line 100 can be turned into a remark statement. All you need to do is insert REM after the line number. Line 110 is a tougher problem. It is more than a remark. Line 110 is actually telling the computer to do something. How can we tell the computer to do something without getting bogged down in the details of note values? The answer is simple: Use a subroutine call and bury the details in the subroutine.

```
100 'PROGRAM A-B-A SONG
110     GOSUB 200 'PLAY A-PART
120     GOSUB 300 'PLAY B-PART
130     GOSUB 200 'PLAY A-PART
140 END
```

Notice that REM is abbreviated here as an apostrophe, as many Basics nowadays allow. On line 110 the apostrophe stands for :REM, which some Basics require for putting a tail remark on a statement.

In one sense, the program is now complete. These five lines tell the computer how to play *any* A-B-A song. However, the description is still abstract, since no note values have been specified. Furthermore, the program will not run yet. Nevertheless, these five lines are complete, and we will never need to look at them again. That is a comfortable feeling.

The form of the program reflects the form of the problem.

The next step is to begin filling in the details. Now is the time to resist the temptation to write in all the note values for "Twinkle, Twinkle Little Star." Instead, the best approach is to write *skeleton* subroutines, which have the right structure, before putting flesh on them. Here is an example:

```
100 'PROGRAM A-B-A SONG
110     GOSUB 200 'PLAY A-PART
120     GOSUB 300 'PLAY B-PART
130     GOSUB 200 'PLAY A-PART
140 END
190 '
200 'SUB A-PART
210     PRINT "A-PART"
280 RETURN
290 '
300 'SUB B-PART
310     PRINT "B-PART"
380 RETURN
```

Now, for the first time, we have a program that can be entered into the computer and run. It won't make music, but it will give us a chance to check out the overall structure and make sure the parts are all in place and work together. Once typing errors have been fixed, a run should produce this output:

```
A-PART
B-PART
A-PART
```

What next? Shall we start plugging PLAY statements into the subroutines? No; not yet. The best strategy now is to save the program, turn off the computer, and think some more about the form of the song. Does the A-part have any structure? What about the B-part? A close look shows that each part is made of two seven-note phrases. The phrases are different in the A-part, but they are the same in the B-part.

```
A-PART
    A1: C C G G A A G
    A2: F F E E D D C
B-PART
    B1: G G F F E E D
    B1: G G F F E E D
A-PART
    A1: C C G G A A G
    A2: F F E E D D C
```

Thus the entire 42-note song is built out of only three different seven-note phrases. So our next step ought to be to change the bodies of the A-PART and B-PART subroutines as follows:

```
200 'SUB A-PART
210     GOSUB 400 'PHRASE A1
220     GOSUB 500 'PHRASE A2
280 RETURN
290 '
300 'SUB B-PART
310     GOSUB 600 'PHRASE B1
320     GOSUB 600 'PHRASE B1
380 RETURN
```

Then we should create new skeleton subroutines for the three phrases. Here they are:

```
400 'SUB PHRASE A1
410     PRINT "A1"
480 RETURN
490 '
500 'SUB PHRASE A2
510     PRINT "A2"
580 RETURN
590 '
600 'SUB PHRASE B1
610     PRINT "B1"
680 RETURN
```

Now it is time to stop planning, turn on the computer again, load the old program, and make the new changes and additions. We can test each new subroutine by entering, for example, the immediate-mode statement GOSUB 400. The final test at this stage is to run the program. The output should be this:

```
A1
A2
B1
B1
A1
A2
```

Now, at last, it is time to enter the actual note values of the song. The structure of the program is the same as the structure of the problem with which we began. The structure is solid and well tested. We can confidently move to the final details and finish the job easily.

What we write as the bodies of the three phrase subroutines will vary according to what computer we are using and what

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Listing 1.

```
100 'PROGRAM A-B-A SONG
110    GOSUB 200   'PLAY A-PART
120    GOSUB 300   'PLAY B-PART
130    GOSUB 200   'PLAY A-PART
140  END
190 '
200 'SUB A-PART
210    GOSUB 400   'PHRASE A1
220    GOSUB 500   'PHRASE A2
280  RETURN
290 '
300 'SUB B-PART
310    GOSUB 600   'PHRASE B1
320    GOSUB 600   'PHRASE B1
380  RETURN
390 '
400 'SUB PHRASE A1
410    PLAY "C C G G A A G2"
480  RETURN
490 '
500 'SUB PHRASE A2
510    PLAY "F F E E D D C2"
580  RETURN
590 '
600 'SUB PHRASE B1
610    PLAY "G G F F E E D2"
680  RETURN
```

version of Basic we have. The program in Listing 1 is the complete program in a version that runs in Microsoft Basic on the PCjr and several other machines.

In this version of Basic, there is a PLAY statement which takes a string expression as data. The letters in the string stand for conventional musical notes. Notes are quarter-notes unless the letter is followed by a number. For example, PLAY "G2" means "play G as a half-note."

In another Basic on a different machine, one might have to write a separate statement for each note. If the Basic lacks any sound statement, one might have to load machine language routines and then use a CALL statement for each note. However, none of those details will have any effect on the overall structure of the program we have created. It is complete.

Summing Up

Now is a good time to take stock of this program and the process we used to create it. First, the program. The main thing to note, as we have already said, is that the form of the program reflects the form of the problem it is intended to solve. In that way, the program is self-documenting. Other than the remark statements used for titles of the main routine and subroutines, there is really no need for explanatory remarks. This is a property of all well structured programs, not just the simple one used here as an example. Unstructured programs need many remarks precisely because they *are* unstructured.

Because the program is easy to read and understand, it is also easy to change. For example, if you wanted to change the form of the song from A-B-A to A-A-B-A, you would know exactly where to go (to the main routine) and what to do (add another GOSUB 200 at the beginning). If you wanted to experiment with other tunes in the same form, you would know that no changes need be made in the main routine or the first two subroutines. Instead, you would simply vary the note values in the three PHRASE subroutines.

Suppose your job was to maintain the same program in six different versions for different computers having different dialects of Basic, plus new machines that come along every few months. Obviously, your job would be far easier if the program were well structured. In the example here, you could limit your attention entirely to the PHRASE subroutines, where you would have to use different Basic statements in some versions.

Now, let's consider the benefits of the process of creating programs like this. The main benefit is that it gives you a systematic way of breaking a large problem down into manageable chunks. As you work on one module, you can often ignore the rest. When coding begins, you can test and debug one module at a time. After the parts work, you can test the whole. Debugging time is diminished.

The other important benefit is that this method allows you to solve a problem at different levels of detail. You move from abstract ideas to concrete actions. At first, you are concerned only with the big picture. Once happy with the program at that top level, you move down a notch and begin to think about some of the details. At each level, you avoid getting bogged down in bothersome details by burying them in still lower levels of subroutines. That way, your mind stays focused on the task at hand.

These, then, are the main advantages of the top-down method of planning and writing programs (or newspaper stories, or technical reports, or pieces of music, for that matter). Give it a try the next time you have a writing task. For quick reference, here are the main steps of the top-down method.

The Steps Of Top-Down Programming

1. Always start with a simple main routine. Use English phrases to describe the major tasks to be done. Avoid thinking about details.
2. Translate each English phrase into a one or two Basic statements. If more are needed, use a GOSUB statement that refers to a subroutine that will contain the details.
3. Write skeleton versions of the subroutines, including PRINT statements for debugging. Run the program and check that things are done in the right order.
4. Fill in the details of each subroutine. Use these same four steps with each subroutine. If new, more detailed subroutines are created in the process, do the same four steps with them.
5. After the program is working according to the original plan, undertake any refinements you think necessary or desirable.

Good programs don't just happen. They require careful planning and faithful attention to form and structure. These ideas are important in any language, though presented here in Basic. At first, it may take you longer to write short programs this way. The payoff will come when you realize that there is no limit to the size of a programming task you can take on and succeed at.

Coming Next Month

The top-down planning method helps you with the job of organizing your ideas without getting bogged down in the details of programming. Sooner or later, though, you must face up to those details and decide what statements to put as the bodies of your low-level subroutines. When you do this, you discover a different kind of complexity: handling the many problems of program logic that seem inevitable when looping and branching are required. Next month's article presents a simple and systematic way of dealing with these problems and avoiding the bane of the inexperienced programmer: "spaghetti code." END

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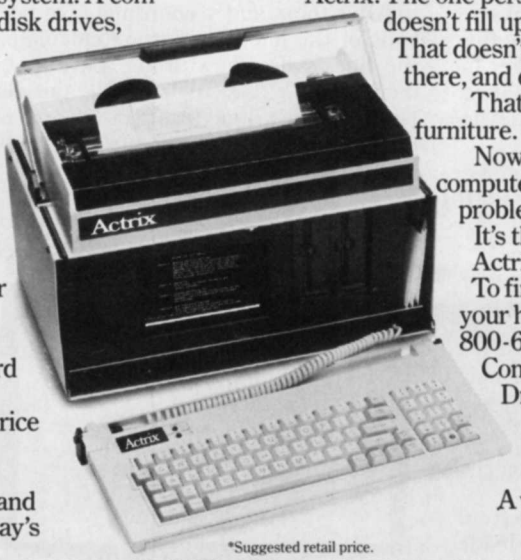

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Simple Screen Graphics With MSX Basic

David H. Ahl

While the turtle graphics feature of the Logo language is certainly useful to generate geometric figures, the old fashioned method using Basic with polar equations can produce similar results.

We start with a Basic program loosely modeled on one by Alan Foxx that appeared in the November issue of *inCider*. It will produce a polygon with any desired number of sides. Since trig functions on the computer require the arguments to be expressed in radians, we will work with multiples of pi. In this program, pi is divided by the number of sides (line 50) and the result, SP, is used as the step size for computing angles in the loop (lines 70-140).

```
10 CLS:PRINT TAB(15);"Polygons":PRINT
20 PI=3.14159
30 INPUT "Number of sides";SD
40 INPUT "Size (5 to 150)";SIZE
50 SP=PI/SD
60 SCREEN 1
70 FOR A=0 TO PI+SP/2 STEP SP
80 SZ=SIZE*SIN(A)+.5
90 X=SZ*SIN(A)+60
100 Y=SZ*COS(A)+96
110 IF A=0 THEN 130
120 LINE (X0,Y0)-(X,Y)
130 X0=X:Y0=Y
140 NEXT
150 GOTO 150
```

Theoretically, the loop should go from 0 to pi, and if the number of sides divide pi into exactly even multiples, this will work. However, this rarely happens, so the last leg of the polygon is not completed; hence, we add one-half of the step size to pi and make that the upper limit of the loop (line 70).

The size of the polygon input in line 40 is roughly the diameter of the circle enclosing the polygon. This is scaled to the length of a side (SZ) in line 80.

After the x and y coordinates of both ends of the line segment are calculated, the line is drawn with the LINE statement in line 120. In line 130, the end points of the line just drawn are redefined as the starting points of the next segment.

Figure 1 shows a six-sided polygon (hexagon) of size 120, and Figure 2 shows a figure with 90 sides of size 150. As the number of sides in a multi-sided polygon approaches infinity, the figure approaches a circle. However, because of the finite resolution of the screen, we do not have to get anywhere near infinity to get a figure that looks like a circle. Use the circle command to draw a circle and compare it with the one produced by this program; with roughly how many sides do they look the same?

This program can be simplified slightly by dividing two pi (360 degrees or a full circle) by the number of sides. This allows line 80 to be eliminated, although now the size input in line 40 is

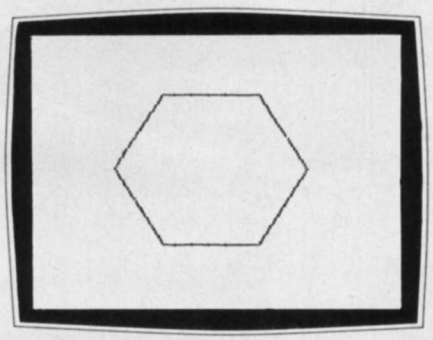

Figure 1. Hexagon produced by basic polygon program.

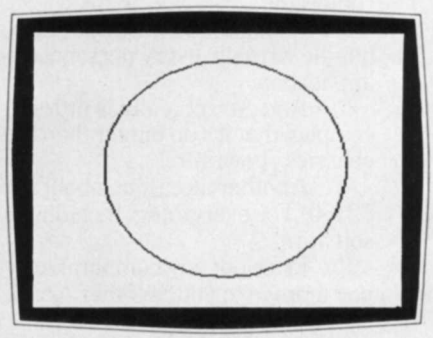

Figure 2. Polygon with 90 sides, size 150.

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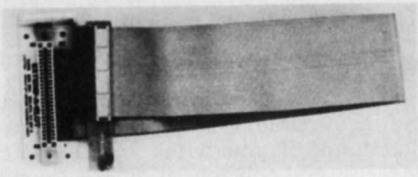

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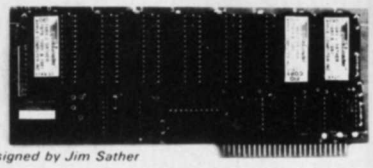

Designed by Jim Sather

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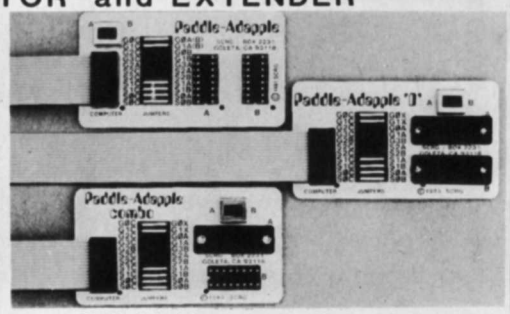

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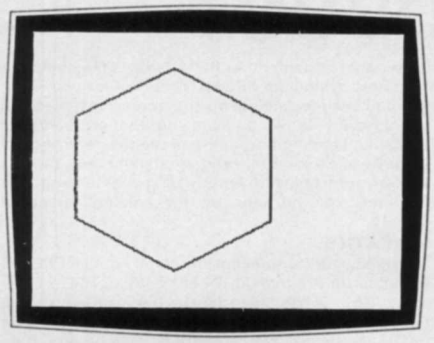

Figure 3. Hexagon made with second basic polygon program.

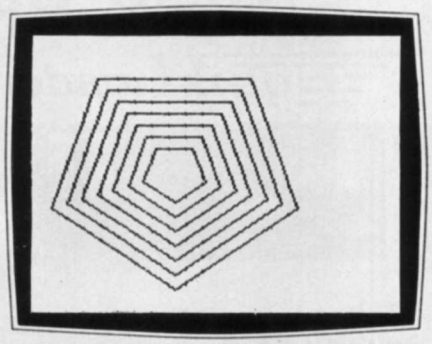

Figure 4. Concentric pentagons, size 80.

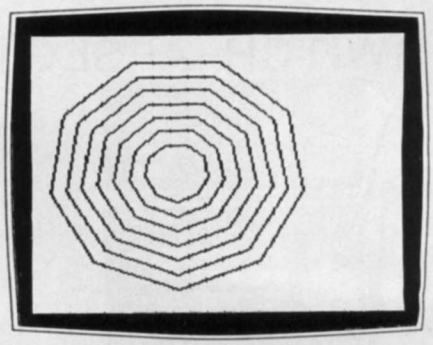

Figure 5. Nine-sided figure, size 80.

the length of a side and not the diameter of the polygon.

```
10 CLS:PRINT TAB(15);"Polygons":PRINT
20 PI=3.14159:TP=PI*2
30 INPUT "Number of sides";SD
40 INPUT "Size (5 to 80)";SZ
50 SP=TP/SD
60 SCREEN 1
70 FOR A=0 TO TP+SP/2 STEP SP
90 X=SZ*SIN(A)+100
100 Y=SZ*COS(A)+96
110 IF A=0 THEN 130
120 LINE (X0,Y0)-(X,Y)
130 X0=X:Y0=Y
140 NEXT
150 GOTO 150
```

You will notice that the orientation of polygons is slightly different with this program. For example, compare the hexagon in Figure 3 (made with this program) to the one in Figure 1.

Concentric Polygons

We next would like to draw concentric or nested polygons. To do so requires a modification of line 40 to put the size in a new variable, SI. Then lines

```
40 INPUT "Size (5 to 80)";SI
65 FOR SZ=SI TO SI/5 STEP -10
145 NEXT
```

65 and 145 create a loop outside the entire polygon plotting procedure to decrease the size of successive polygons by ten (from SI down to SI/5). Figures 4 and 5 show the output from this modification.

Let's say that instead of exactly concentric polygons, we would like less distance on one side than the other. This is easily accomplished by adding an additional amount to the x distance in line 90. For example, we could add one third of SZ which would produce the hexagon in Figure 6.

```
90 X=SZ*SIN(A)+100+SZ/3
```

Or, if we wanted a greater offset, we could add a larger quantity, say SZ. The output from this change is shown in Figure 7.

```
90 X=SZ*SIN(A)+100+SZ
```

Of course, it is possible to add an offset in both the x and y direction. Lines 90 and 100 offset both x and y by SZ/2.

```
90 X=SZ*SIN(A)+100+SZ/2
100 Y=SZ*COS(A)+50+SZ/2
```

The result is shown in Figure 8.

Multiple Polygons

Next, let's take the basic polygon generating program (you can make it into a subroutine if you wish) and use it to make several polygons at different points on the screen. To draw two polygons, one offset from the other by 80 units, we

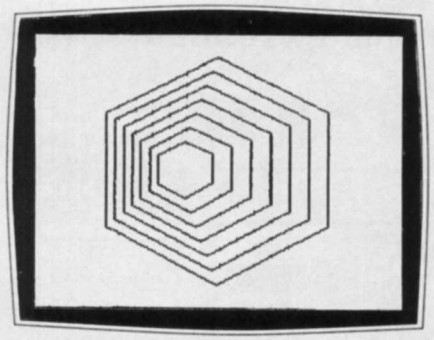

Figure 6. Horizontal (x) dimension offset by SZ/3.

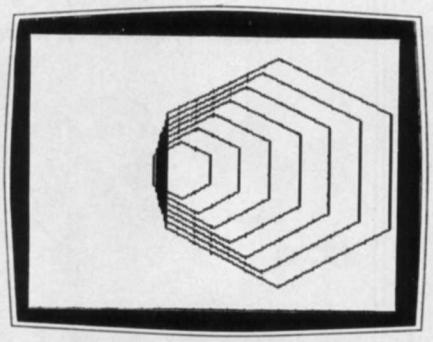

Figure 7. Horizontal offset by SZ.

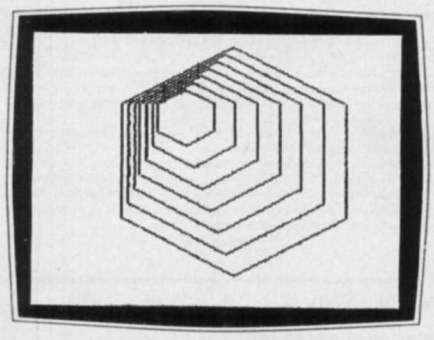

Figure 8. Both x and y offset by SZ/2.

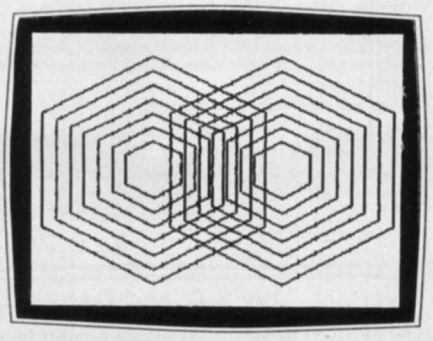

Figure 9. Two hexagons of size 80 (side), 80 units apart.

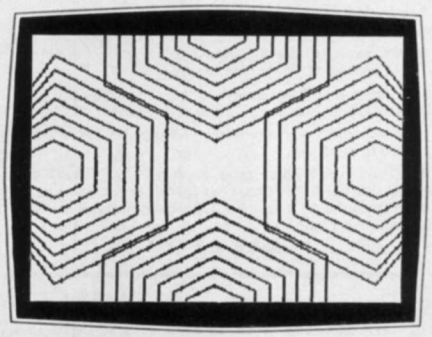

Figure 10. Four hexagons (size 80), 100 units apart.

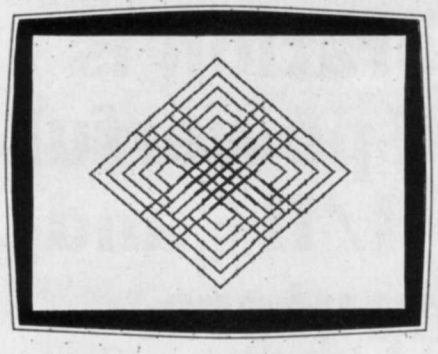

Figure 11. Four squares (size 50), 30 units apart.

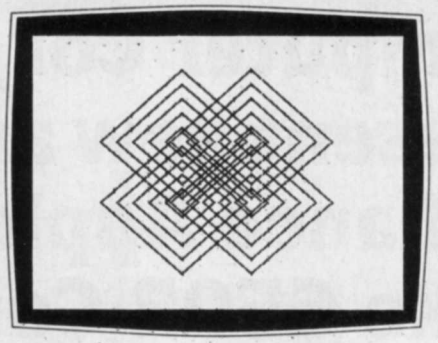

Figure 12. Same as Fig. 11, but outside square rotated 45 degrees.

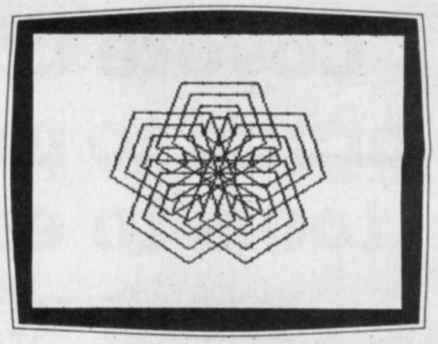

Figure 13. Generalized routine to draw outside polygon.

could add the following four lines.

```
45 I=80
90 X=SZ*SIN(A)+I
150 IF I=80 THEN I=160:GOTO 65
160 GOTO 160
```

The distance I, initially 80, is added to all x distances and, when the first plot is finished, a second one is made with an I distance of 160 (see Figure 9).

However, if we want to add more polygons, we can use a routine similar to that used to produce the polygons in the first place. For example, to produce four sets of polygons, we could add the following four lines.

```
61 FOR B=0 TO TP STEP TP/4
62 X2=100*SIN(B)
63 Y2=100*COS(B)
150 NEXT
```

The result of doing this is shown in Figure 10—not exactly what we had in mind. The problem is that there is too much distance between the polygons. Let's decrease the distance to 30 units with new lines 62 and 63.

```
62 X2=30*SIN(B)
63 Y2=30*COS(B)
```

The result of this change is shown in Figure 11. Ah, that's more like it. At the moment, the orientation of both the inside and outside polygon (square) is the same. If we change the starting point from 0 to TP/8 (one-eighth of two pi, or one-half of each angle, or 45 degrees), and increase the ending point a similar amount, the square flops on its side (see Figure 12).

```
61 FOR B=TP/8 TO TP+TP/8 STEP TP/4
```

However, there is no reason to restrict our outside polygon to a square. Actually, why not let it be the same polygon as the concentric ones? This is easily accomplished with the following two lines.

```
50 SP=TP/SD:LM=TP/(SD*2)
61 FOR B=LM TO TP+LM STEP SP
```

If you run this, you will find that the first polygon that was drawn is traced over a second time—and not always in exactly the same place as the first one. We can eliminate this overtrace by lowering the upper limit of the loop by one-half of the angle (LM). The result is shown in Figures 13 and 14.

```
61 FOR B=LM TO TP STEP SP
```

Now let's say that we would like to spread out the image in the horizontal direction to fit the dimensions of the screen better. This can be done by adding a larger offset in the x direction than the y direction. Compare the image in Figure 15 made with a 50-unit x multiplier and 30-unit y multiplier to Figure 13 made with equal 30-unit x and y multipliers.

```
62 X2=50*SIN(B)
```

Some of the effects, particularly the moiré patterns can be made more interesting by changing the distance between the concentric polygons. For example, adding the following line 65 results in a pattern with closer spacing (see Figure 16).

```
65 FOR SZ=SI TO SI/5 STEP -6
```

After some experimentation, we determined that the outside group of polygons should be spaced closer together if they have a small number of sides and spread apart if they have more sides. This change can be made by letting the distance between outside polygons be a function of the number of sides. This has been made in the new lines 62 and 63 below. We have also increased the spacing

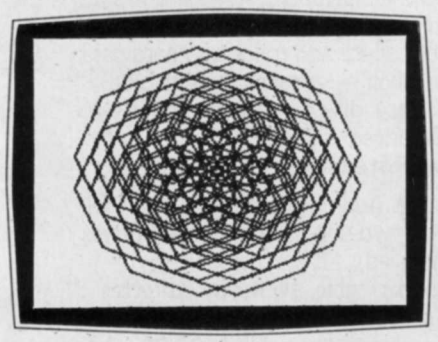

Figure 14. Generalized routine with eight sides, size 60.

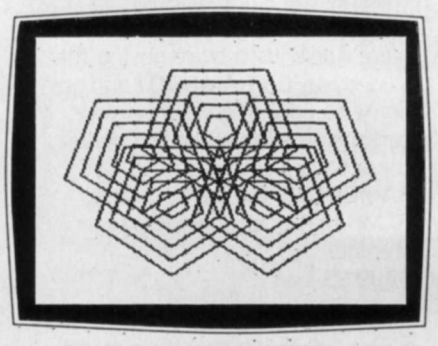

Figure 15. Horizontal (x) offset increased to 50; y is 30.

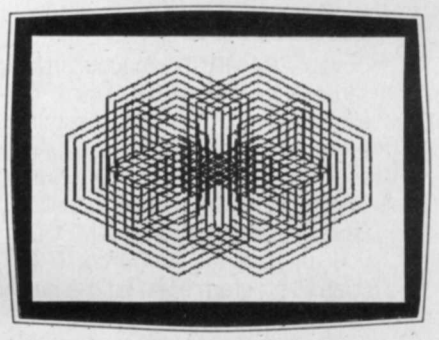

Figure 16. Closer spacing of concentric polygons (6 units) produces interesting patterns.

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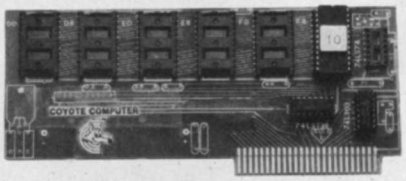

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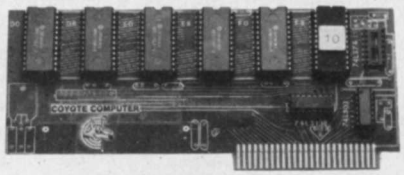

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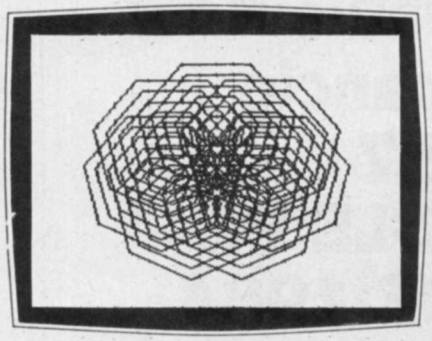

Figure 17. Routine added to make spacing of outer polygon a function of the number of sides.

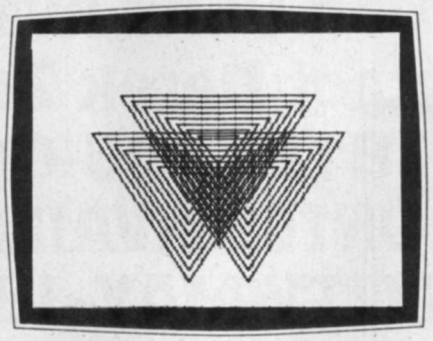

Figure 18. Triangles with five-unit concentric spacing.

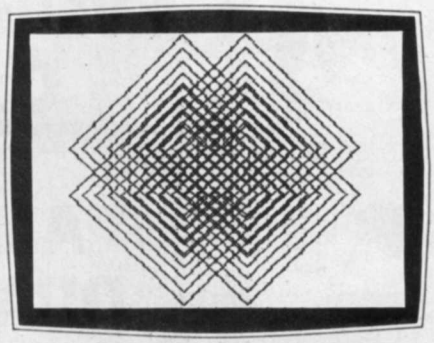

Figure 19. Correction made for screen distortion.

between concentric polygons in line 65. The results are shown in Figure 17.

```
62 X2=(SI*SD/10)*SIN(B)
63 Y2=(SI*SD/12)*COS(B)
65 FOR SZ=SI TO SI/5 STEP -8
```

We have made so many changes to the basic program that it is time to see where we are. Let us use the RENUM function and print the program as it currently stands. Figure 18 was made with this program.

```
10 CLS:PRINT TAB(15);"Polygons":PRINT
20 PI=3.1415926536#:TP=PI*2
30 INPUT "Number of sides";SD
40 INPUT "Size (5 to 70)";SI
50 SP=TP/SD:LM=TP/(SD*2)
60 SCREEN 1
70 FOR B=LM TO TP STEP SP
80 X2=(SI*SD/10)*SIN(B)
90 Y2=(SI*SD/12)*COS(B)
100 FOR SZ=SI TO SI/5 STEP -8
110 FOR A=0 TO TP+SP/2 STEP SP
120 X=SZ*SIN(A)+128+X2
130 Y=SZ*COS(A)+96+Y2
140 IF A=0 THEN 160
150 LINE (X0,Y0)-(X,Y)
160 X0=X:Y0=Y
170 NEXT
180 NEXT
190 NEXT
200 GOTO 200
```

There are some other things that can be varied to achieve different effects. For example, because of the screen layout, the distance between horizontal (x) pixels is slightly longer than between vertical (y) pixels. Thus, a square drawn on the screen with the true mathematical coordinates is not truly square, but has angles of about 82 and 98 degrees. We can correct this by multiplying y distances by 1.1 (this is not precisely correct, but it is very close). Figure 19 was made using this correction in line 130.

```
130 Y=1.1*(SZ*COS(A))+96+Y2
```

Instead of rotating the outside polygon exactly one-half of the angle of each corner, we can add a small factor and achieve somewhat different effects. Figure 20 shows the effect of this; compare it to Figure 18.

```
50 SP=TP/SD:LM=TP/(SD*2)+.07
```

Concentric polygons can be spaced together even more closely—say at a distance of five or fewer units—to produce very dense patterns. Figure 21 was produced with five-unit spacing using this line 100.

```
100 FOR SZ=SI TO SI/5 STEP -5
```

Combined Effects

Some really dramatic effects can be achieved by combining several different approaches. Specifically, combining the x or y offset (Figures 6 to 8) with the outer group of polygons (Figures 12 to 19) produces some very interesting effects. They are particularly interesting if the tight spacing between rings is toward either the center or the outside of the entire image. This can be done with very few additional program lines.

Another fascinating effect can be achieved by letting the polygon move across the image area, either staying the same size or decreasing in size. This involves simply adding a constant x offset in line 80 (see Figure 22). When this is combined with the concentric rings and/or a rotating outside group, some amazing effects are produced.

We have deliberately not pictured these effects, because we want you to discover things on your own and not be bound to our directions. We have set you moving; now it is up to you to go in the direction you want.

Yes, we promised spirals and the Sierpinskey curve in this tutorial, but they will just have to wait until next time. Until then . . . . END

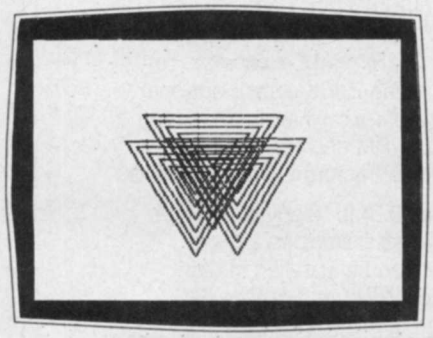

Figure 20. Small factor added to starting point of outer polygon rotation.

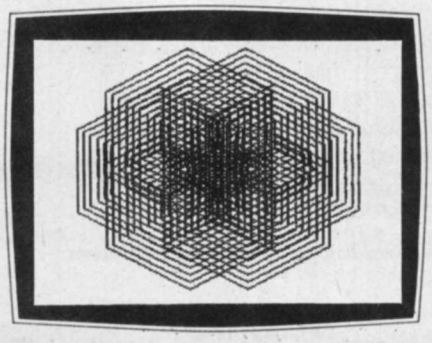

Figure 21. Hexagons of size 60 with five-unit concentric spacing.

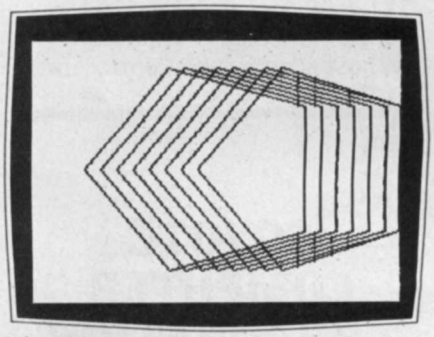

Figure 22. Adding a constant factor to x lets the polygon move across the image area.

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Going Around In Circles: Mathematics and Computer Art

Part 1

Sheldon P. Gordon and Florence S. Gordon

Mathematicians have a reputation for being strange people. This is probably due to their fatal fascination for things that would never occur to most people or, if they ever did, would be quickly forgotten. For example, suppose you stick a wad of chewing gum on the rim of a bicycle tire. Have you any idea of the path travelled by the gum as the wheel turns? Just in case you are tempted to find out, the curve is shown in Figure 1. It is famous enough in mathematics to have its own name; it is called a *cycloid.*

Until the microcomputer revolution, curves such as this could be handled only with higher mathematics and could be drawn only with the greatest difficulty by hand. Today, though, such a picture can be drawn with great accuracy, color, and even sound at the push of a button. This tremendous power in the hands of a mathematician must surely lead to the creation of even more esoteric shapes.

Now suppose that the wheel with the gum on it is rolling around the inside rim of a still larger wheel, as shown in Figure 2. (The problem of how this can actually happen in practice is something that is left to physicists and engineers to figure out.) Again, the challenge is to determine the path traced by the gum. The curve that is formed depends very much on the radius of the rolling circle, A, and the radius of the larger outer circle, B.

Figure 1.

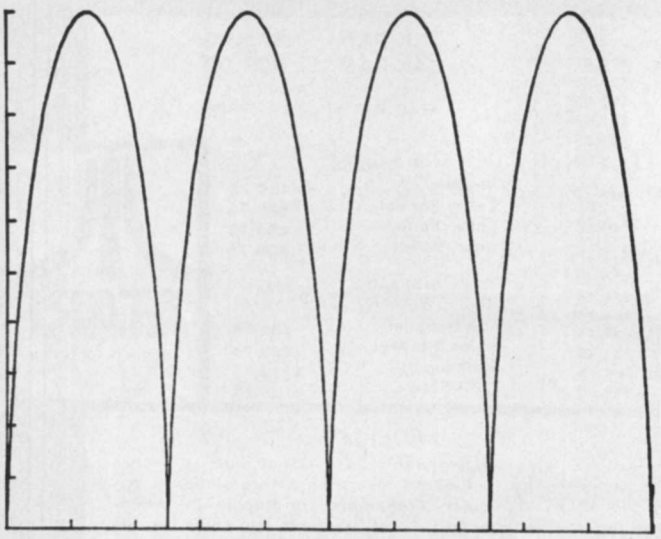
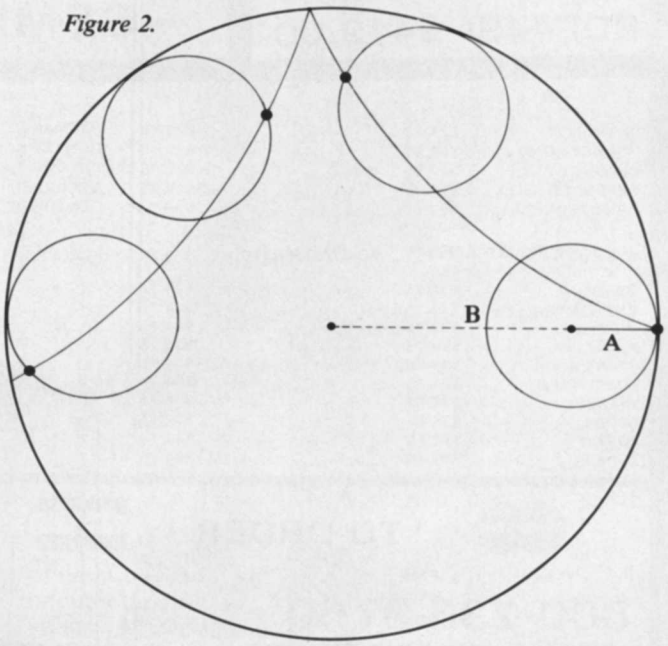


Figure 2.



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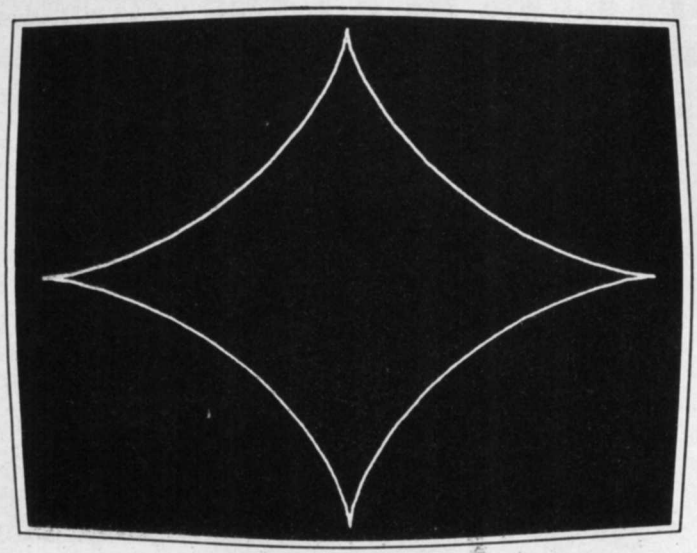


Figure 3a.

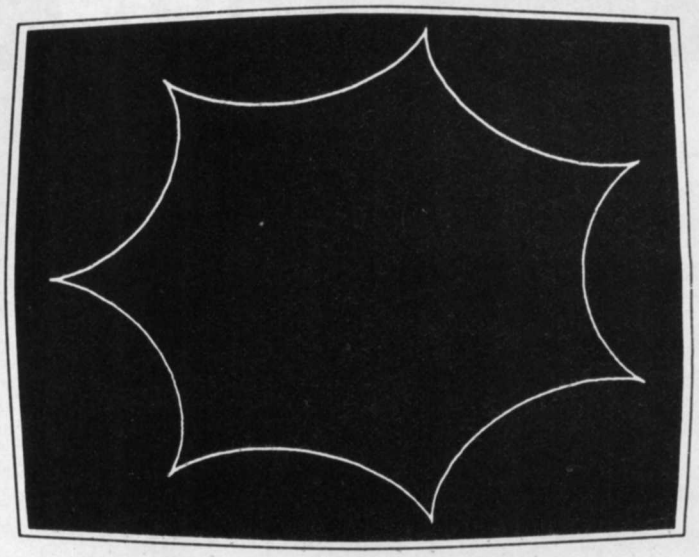


Figure 3b.

For those readers who are mathematically inclined, the curve generated in this manner is called a *hypocycloid*, and it is given by the pair of equations:

$$x = (B\text{-}A)\cos\left(\frac{At}{B}\right) - A\cos\left(\frac{B\text{-}A}{B}\,t\right)$$

$$y = (B\text{-}A)\sin\left(\frac{At}{B}\right) + A\sin\left(\frac{B\text{-}A}{B}\,t\right)$$

Once these equations are supplied to a computer program which will graph any parametric curve, we can obtain the shape of the hypocycloid for any choice of the two radii. Let's start with A = 1 and B = 4, for example. The program produces the shapes in Figure 3a, while 3b corresponds to A = 1 and B = 7. Clearly, from these two examples, we can predict what shape will occur when A = 1 and B is any integer.

From a mathematician's point of view, one of the big drawbacks in using computer graphics is the resolution.

Finding Patterns

However, what if A is not 1? What happens, for example, when A = 2 and B = 7. The result is shown in Figure 4a while 4b shows what results when A = 2 and B = 9. In the first case, there are exactly seven points to the figure and, in the second, there are exactly nine points. This is certainly not a coincidence. Further, if you trace around each of the figures with a finger, you will notice that one complete cycle (until you get back to the original starting point) involves two full revolutions. Thus, we might wonder if using A=3 would require three full revolutions to trace out the full curve. Let's try A=3 and B=7. As anticipated (See Figure 5) there are seven points to the figure and it takes three full revolutions to complete it.

At this point, you might feel that you have completely mastered the patterns for the hypocycloid. For example, if A=12 and B=47, then you would probably expect a shape containing 47 points that requires five full revolutions to complete. That happens to be correct; however, there are still a few surprises left. For example, what if we have the computer draw the hypocycloid with A=4

Figure 4a.

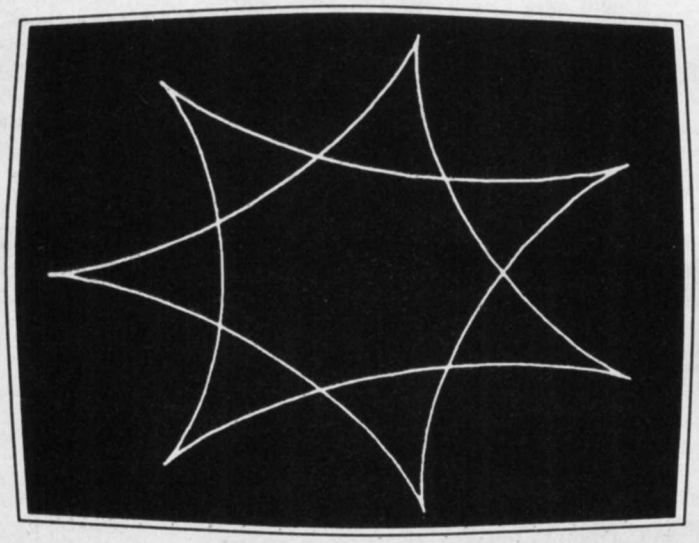
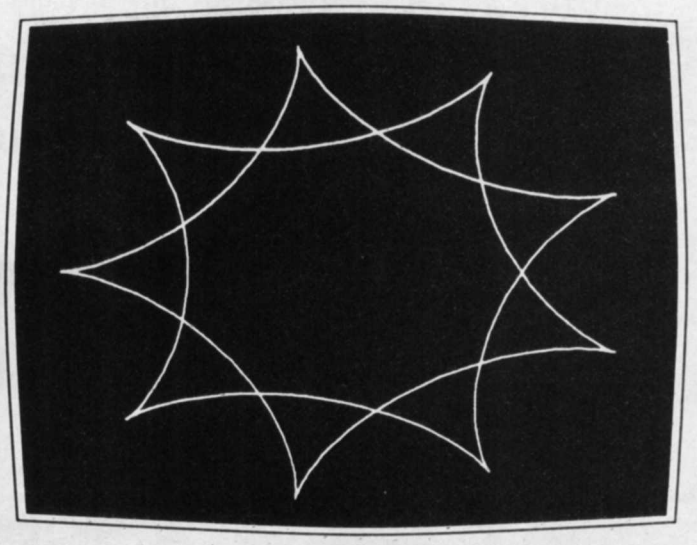


Figure 4b.



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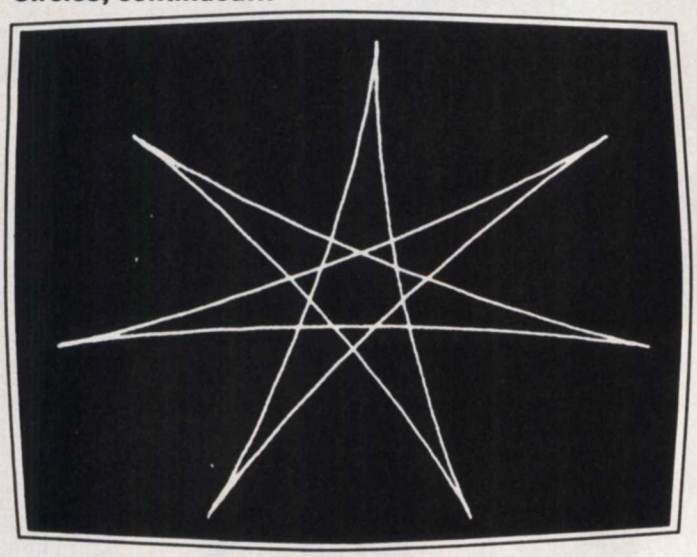


Figure 5.

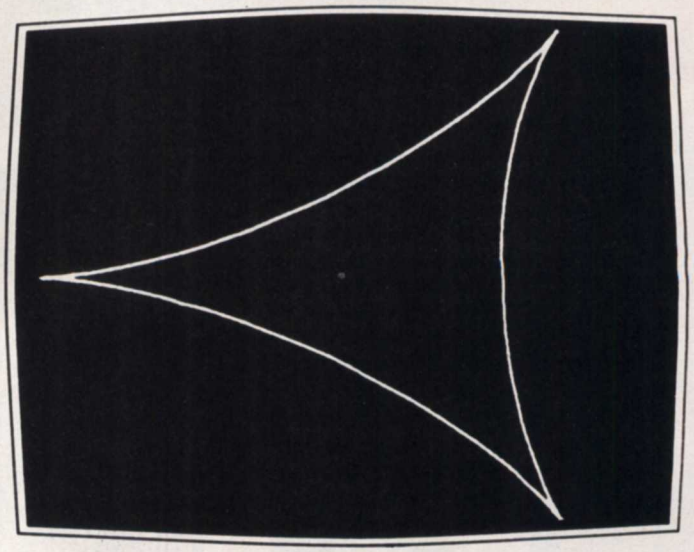


Figure 6.

and B=12. The result is shown in Figure 6 and looks suspiciously like what you would expect the curve for A=1 and B=3 to be. What happened?

Well, if you look at the radii 12 and 4, you might notice that their ratio is 3:1. With this in mind, it turns out that the shape for A=5 and B=15 is the same, as is the shape for A=10 and B=30. For that matter, the identical shape is obtained whenever B is three times A. Similarly, the shape for A=12 and B=33 is the same as for A=4 and B=11, as shown in Figure 7.

The shapes shown above are all very simple; you can easily count the number of points and the number of revolutions. This was done to demonstrate the geometric patterns that exist. However, if we use larger values for A and B, we get some extremely beautiful shapes, so let's stop worrying about the mathematics and concentrate on the aesthetics instead. For example, suppose we take A=13 and B=33, so that we produce the shape shown in Figure 8. If we jump to even larger values for the radii, say A=17 and B=59, then we get an even more intricate and fascinating shape, as seen in Figure 9. In each of these last two cases, the predicted pattern holds.

Problems With Resolution

From a mathematician's point of view, one of the big drawbacks in using computer graphics is the resolution. The results obtained may not be precisely accurate enough. The addressable points on the computer screen are not fine enough to get exactly the right location; the points are located by a rounding process which introduces a certain degree of error. When the number of points involved becomes very large, this error can be drastically magnified and the mathematician will cringe at the result. On the other hand, these inaccuracies also produce some striking visual effects as the predicted patterns break down. So we will now forego mathematical accuracy in the pursuit of art.

Let A=2222 and B=8888. The corresponding curve is shown in Figure 10. It may not be accurate, but it is certainly pretty. Similarly, Figure 11 shows the results of using A=1250 and B=5000. Finally, in Figure 12, we show the results obtained for A=2500 and B=10,000. For each of the three cases, the pattern predicts that the shape should reduce to the case A=1 and B=4, but the resolution inaccuracies are just too large. However, while the shapes are not what we would expect mathematically, they are certainly beautiful to look at.

Figure 7.

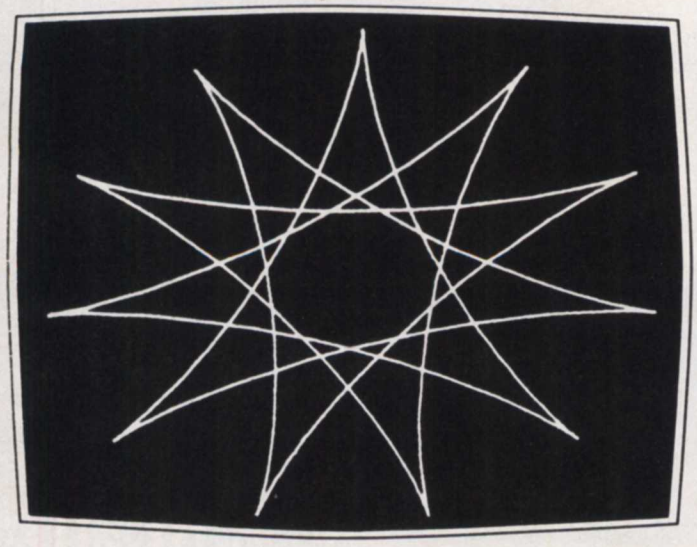
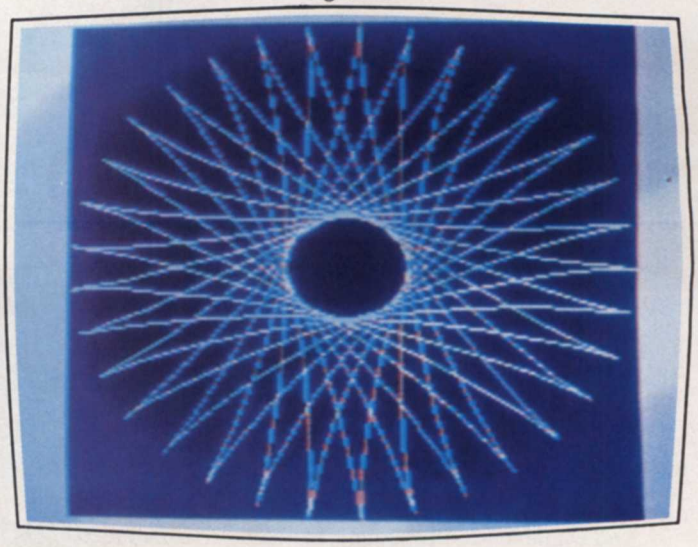


Figure 8.



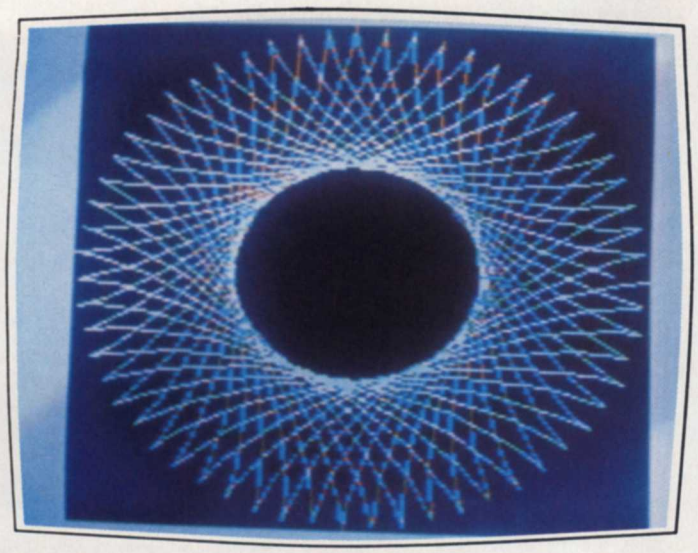


Figure 9.

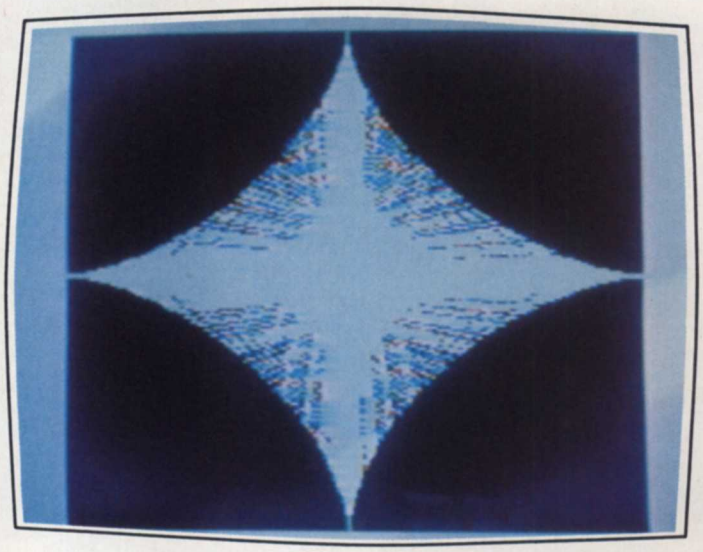


Figure 10.

At this point, it makes little sense to keep showing sample pictures. It is much more fun to try the program yourself. Listing 1 is a simple program to generate these shapes. It is written for a TRS-80 Color Computer with Extended Basic. It is fairly simple to convert it to run on other machines if you are familiar with graphics. Incidentally, the inaccuracies which make some of the designs so attractive vary from machine to machine, so different shapes may result from the same values for A and B when they are both large.

However, before we get to the actual program, it might be worth noting that there are still several slight twists possible when dealing with hypocycloids and similar mathematical curves which lead to other fascinating and beautiful patterns. These will be described in a series of follow-up articles. END

Listing 1.

```
10 PMODE 4,1
20 SCREEN 0,0
30 CLS
40 PRINT:PRINT:PRINT
50 PRINT "      THIS PROGRAM GRAPHS
60 PRINT
70 PRINT"        ANY HYPOCYCLOID"
80 PRINT:PRINT:PRINT
90 PRINT"PROGRAM WRITTEN BY FLORENCE AND    SHELDON GORDON"
100 PRINT:PRINT"COPYRIGHT 1983"
110 FOR T = 1 TO 1200 : NEXT
120 CLS
130 PRINT:PRINT:PRINT
140 INPUT "WHAT IS THE LARGE RADIUS";AA:PRINT
150 INPUT "WHAT IS THE SMALL RADIUS";BB : IF BB>=AA THEN PRINT:PRINT:GOTO140
160 C1=AA-BB
170 C2=C1/BB
180 DEF FNX(T)=C1*COS(T)+BB*COS(C2*T)
190 DEF FNY(T)=C1*SIN(T)-BB*SIN(C2*T)
200 A=0 : B = 6.28*BB
210 N1 = -AA : N2 = AA
220 M1 = N1 : M2 = N2
230 D=(N2-N1)/255 : E=(M2-M1)/191
240 PCLS
250 NR=10*(AA+BB)
260 IF NR>400 THEN NR=400
270 REM  DRAW GRAPH
280 SCREEN 1,1
290 H=INT((FNX(A)-N1)/D +.5)
300 V=191 - INT((FNY(A)-M1)/E+.5)
310 LINE(H,V)-(H,V),PSET
320 ST=(B-A)/NR
330 FOR T=A+ST TO B  STEP ST
340 X=FNX(T)
350 H=INT((X-N1)/D +.5)
360 Y=FNY(T)
370 V=191-INT((Y-M1)/E +.5)
380 LINE-(H,V),PSET
390 NEXT T
400 GOTO400
410 END
```

Figure 11.

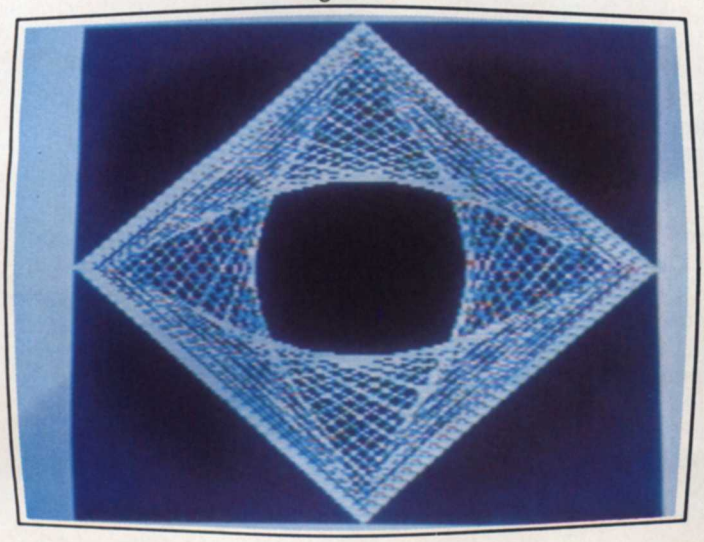
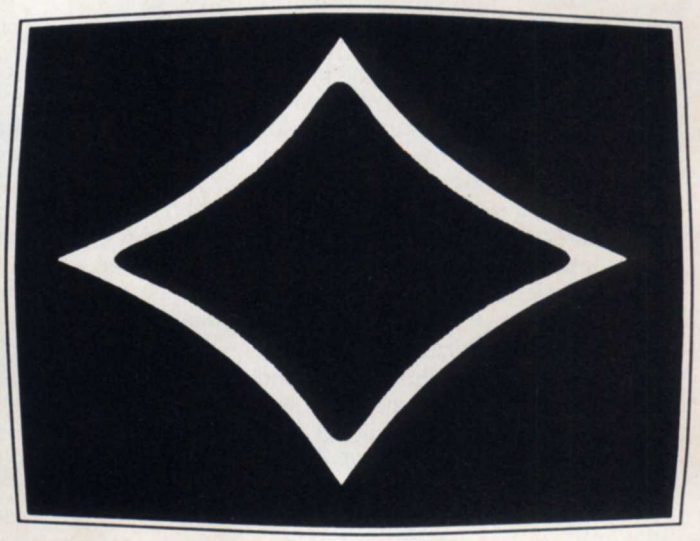


Figure 12.



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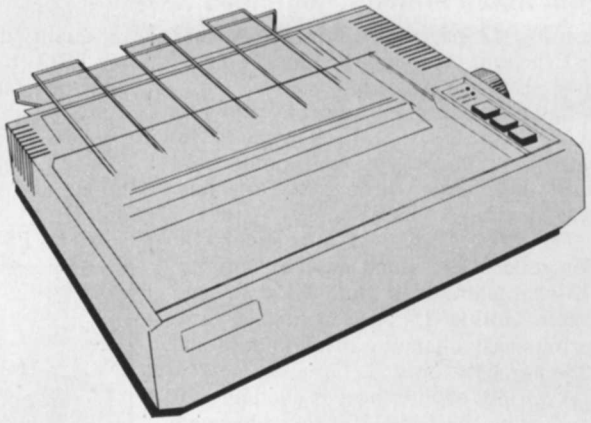


Print About Printers

John J. Anderson and William Puetz

What ho, readers. Welcome back to the world of print thimbles, daisywheels, and dot matrices. Here at the lab we've given up trying to get the ribbon ink off our fingertips. Might as well just let it wear off with time. And about the only reason we pick up a pencil anymore, except for the *Times* crossword, is to set printer DIP switches. Like, printers are my life, man.

Last month we promised a continuation of new products information, cut short because we lacked space. We'll begin with that this time around, then William Puetz will review the Juki 6100 daisywheel printer.

First, here is the late-breaking printer news.

New Products: Ricoh

Ricoh, a Japanese company that first broke into the U.S. market with small, high-quality copy machines, announced a substantial line of printer products. They range from low-cost thermal and serial printers to plotters and a tabletop laser printer. Ricoh voiced an ongoing commitment to microcomputer peripherals at winter Comdex.

• The TP-X is a thermal printer capable of printing at up to 100 cps. The 24-element printing head delivers clean, near letter quality printing at an output resolution of 180 dots per inch.

The Ricoh TP-X Thermal Printer.

Weighing in at less than 12 lbs., the TP-X accepts 10″ wide roll paper that uniquely cuts sheets to any length on a 100′ roll. It provides near letter quality at 50 cps. The printer uses either a thermal transfer on plain paper or thermal dot print method on thermal sensitive paper for improved economy. The thermal transfer employs a thermal ribbon on plain paper for high quality and a longer-lasting document.

The Ricoh GP-1 four-color ballpoint pen plotter.

Ricoh has also introduced three daisywheel printers, ranging in speed from 20 to 50 cps.

• The high-speed 1600Q, which at a speed of 50 cps handles even the heaviest printing requirements at highest quality, operates at a low, 50-decibel noise level. The 1600Q accommodates the wide paper required in data system applications.

• The 1500Q, at 40 cps, also operates at a low noise level of 50 decibels.

• The 1200N, at 20 cps speed, is useful for personal computer applications. It weighs in at 26 lbs. and also features low-noise output.

Each machine in this line features Ricoh's exclusive double-daisy print wheel for typeset print quality. Bidirectional printing, rapid tab/carriage return speeds, and linefeed speeds are built-in timesavers. All of the printers accept optional forms tractor feeder, letter guide, and cut sheet feeder.

• In addition to this line, Ricoh will market a four-color ballpoint pen plotter. The GP-1 has a print speed of up to 120 millimeters per second and can print in ballpoint or felt-tip pen. It features 26 plotter commands and an oil pen that lasts 1000 meters. The plotter weighs a mere 13 lbs.

The unit accepts a variety of paper types, including 10″ wide, perforated-roll paper, 8 ½″ x 11″ cut paper, and 8 ½″ x 11″ transparencies. Print resolution is typically 0.3 mm or less.

The Ricoh LP4120 Tabletop Laser Printer.

• To top off their new products, Ricoh introduced the LP 4120, a state-of-the-art tabletop laser printer capable of

printing 12 pages per minute. At 112 lbs., the unit is among the most compact laser printers developed.

Laser technology, which replaces much of the internal mechanical movement found in conventional printers, and short paper path through the machine help maximize reliability.

The printer employs the Ricoh LP Controller 120, which has two internal 128-character fonts: Bold Face PS and Letter Gothic 15. The controller also permits easy changing of two additional 128-character fonts.

A variety of interfaces is available for connecting the LP 4120 to a wide range of office equipment including word and data processors, electronic mail devices, local area network systems, and personal computers.

Pricing on Ricoh printers was not available at press time.

Olympia

Olympia has introduced four new printers, ranging in price from $500 to $1900 and covering nearly the entire range of micro printers.

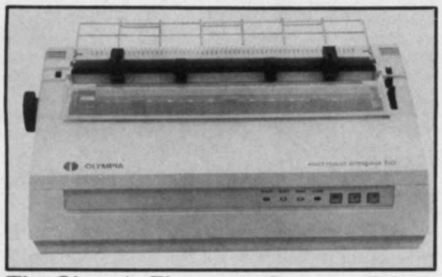
• The Electronic Compact NP is a dot matrix printer with a top print speed of 165 cps. It uses the same ribbon as the

The Olympia Electronic Compact NP.

Epson FX-80, which is among the easiest to find. In dual pass script mode, print approaches letter quality.

The Olympia NP accepts fanfold or friction feed single sheets and has a noise output of under 65 dB. It has a print buffer of 2K and a self-test mode. It lists for $499.

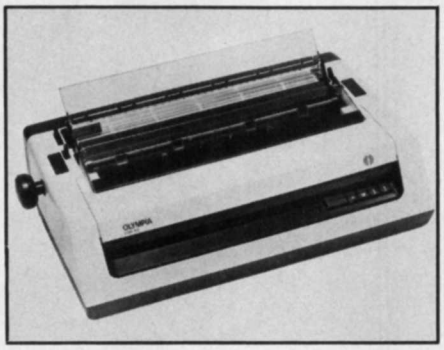
• The Electronic Compact RO is a letter quality daisywheel printer which lists for $699. It comes with serial and parallel interfaces built-in and can handle 10, 12, and 15 pitch print wheels. Print speed is 14 cps.



The Olympia Electronic Compact RO.

The Compact RO has a 256-character buffer and a noise output of less than 65 dB.

• The ESW 102 letter quality printer

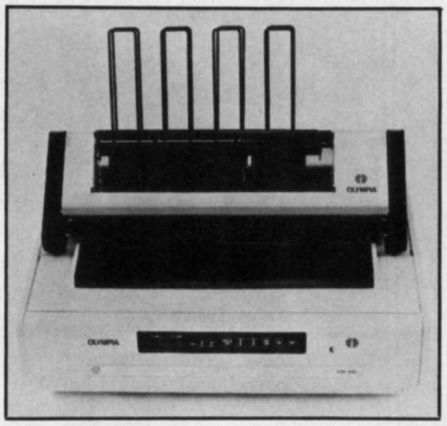


The Olympia ESW 102.

uses "Whisperdisc" daisywheels capable of producing an extra-sharp impression. Print speed is 17 cps, and a 4K buffer is standard. Bold, expanded, and doubleprint are available, as is incremental spacing horizontally and vertically.

The ESW 102 lists for $999 and sports serial and parallel interfaces standard. Tractor feed is available as an optional accessory.

• The ESW 3000 letter quality printer is a high quality cost-effective printer designed for high speed daisywheel printing. Print speed is up to 50 cps; 40 cps is



The Olympia ESW 3000 letter quality printer.

typical using average English text in 12 pitch. This is about as fast as daisywheel printers can get.

A 4K buffer is standard, as are serial, parallel, and IEEE-488 interfaces. The ESW 3000 is designed for a heavy duty cycle and trouble-free high-speed performance. It has an optional forms tractor and cut-sheet feeder. List price for the unit is $1899.

Vivitar Cut-Sheet Feeder

Vivitar has introduced cut-sheet feeders for Transtar as well as other printers, at $399 retail. This is less expensive than any other single-sheet feeders we've seen.

Vivitar feeders attach in seconds; no tools or electrical connections required. They will feed up to 200 sheets of paper before requiring a refill. Ribbons and printwheels can be changed without removal of the sheet feeder. Envelopes, checks, and special labels can also be fed.

There are four models, servicing the following printers: Transtar, Silver-Reed, Morrow, Sanyo, NEC, C. Itoh, Philips, Facidata, Toshiba, Televideo, Diablo, Hewlett Packard, AB Dick, Burroughs, and others.

About the time we received a Juki 6100 daisywheel printer for evaluation, we also received a thorough review from William Puetz, a micro consultant from Normal, IL. We largely agreed with Mr. Puetz's overview, and shall turn over the remainder of this month's column to his comments concerning the machine.

Juki 6100

Back when I purchased my first printer, an IDS-440 Paper Tiger (whose mediocre print quality fetched over $1200), the price for letter quality printers was in the $2500 range. Because I couldn't afford one, I harbored a secret wish for all daisywheel owners: I hoped that the petals on their daisywheels would wilt. This jealousy transformed me into an easy mark for any printer manufacturer offering "correspondence quality print," and I quickly accumulated an assortment of dot matrix printers.

Finally, prices started dropping on the daisywheels. But alas, the drop in price meant a drastic drop in print speed, too. Finally, Juki Industries, a long time manufacturer of office machines, has come to the rescue with the Juki 6100.

This new daisywheel printer prints a robust 18 cps. Not only is the Juki much faster than other low cost daisywheels, it prints bi-directionally with logic seeking (searching for efficient print paths). Because of the logic seeking and rapid printhead movement over white spaces, the Juki appears to be faster than its rating. And while the Juki offers a decent increase in speed, it does so quite inexpensively; the Juki lists for a moderate $699.

Should the 6100 require repair, Juki has a network of 13 regional distributors across the country to provide service. There isn't a Juki dealer in my town, but

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CIRCLE 118 ON READER SERVICE CARD

The Juki 6100 daisywheel printer.

the distributor that services my area, Information Systems of Arlington Heights, IL, has been extremely helpful.

Documentation

The original manual packaged with my Juki was one of the worst I have ever seen. A scant 25 pages long, it was packed with grammatical and spelling errors. But inside was a slip that indicated that it was just a temporary manual; the production manual would be available soon. (This improved documention is now shipping—Ed.)

Printer Features

Let's take a closer look at the features that make the Juki such a good value. If a majority of your printing consists of long, single-spaced lines, you may be disappointed in the 18 cps print speed. But give the Juki double-spaced documents or forms with a significant amount of white space, and you may find that it is the only printer you'll need. The printhead absolutely flies over white space. Best of all, the Juki doesn't sacrifice quiet operation to gain speed. The noise level is rated at less than 63 dB—quiet by any standard.

My major consideration when shopping for a new printer was the availability of printwheels and ribbons. Some dot matrix printers require ribbons that can set you back well over $10 a shot. Juki, on the other hand, takes a very reasonable approach and uses IBM Selectric-style ribbons. Two ribbon types are supported, multi- and single-strike, and the Juki automatically senses which is being used. The carbon single-strike ribbons offer extremely high quality, are available for less than $2 each, and are rated for 160,000 characters (50 to 100 pages depending on how full you pack them and how much boldface and shadow printing you use). The multi-strike ribbons are somewhat more costly (about $5 each), but are rated for 480,000 characters.

Printwheels are a slightly different matter. Juki Industries sells only three of the 100-character printwheels, all containing the full ASCII standard character set. The 6100 also can use Triumph-Adler wheels, which are not readily available in some areas. A brochure received from an Adler dealer lists 20 type styles as currently available, but the wait for additional wheels from this dealer was over a month. The Triumph-Adler wheels aren't standard ASCII (see Figure 1) and the cost isn't all that attractive either—$25 per wheel. But the wheels are rated for 10,000,000 characters and will outlast many ribbons.

Changing the ribbons and printwheels couldn't be easier. The ribbon cartridge snaps in and out under the control of a single lever. The printwheel is likewise released and engaged by just one lever. To change wheels, the lever is pulled back, the old wheel removed, a new wheel dropped in, and the lever pushed forward. The printer automatically locks the printwheel into alignment on every reset or initialization, so it is difficult to insert a wheel improperly.

Controls and Indicators

The front panel contains three membrane switches, three LED indicators, and a slide switch for pitch control. The Juki can print in any of the common pitches: 10 characters per inch (cpi), 12 cpi, 15 cpi, or proportional spacing. The pitch control takes effect only when the printer is turned on or a special software control code is issued.

The three LEDs are labeled Power, Ready, and Check. Checks include both recoverable and non-recoverable errors. When a recoverable error is encountered, such as reaching the end of a single sheet of paper, the Check light glows a soft red and a beep sounds. Should a non-recoverable error, such as a paper jam or hardware malfunction occur, the Check light flashes. Both the Power and the Ready light are green, and the Ready light has a flashing mode which indicates a data transfer error.

The membrane switches are labeled Reset, Pause, and Form Feed. A control conspicuous by its absence is a single linefeed. The Pause switch halts printing in mid-line, allowing for ribbon or printwheel changes. If the printhead is moved while changing a ribbon or printwheel, printing resumes at the exact location at which the Pause switch was depressed—a very handy feature.

A self-test feature is activated by pressing on the Form Feed switch while turning the printer on. Releasing the Form Feed switch causes the RAM buffer, the optional serial interface, if installed, and the character set to be tested.

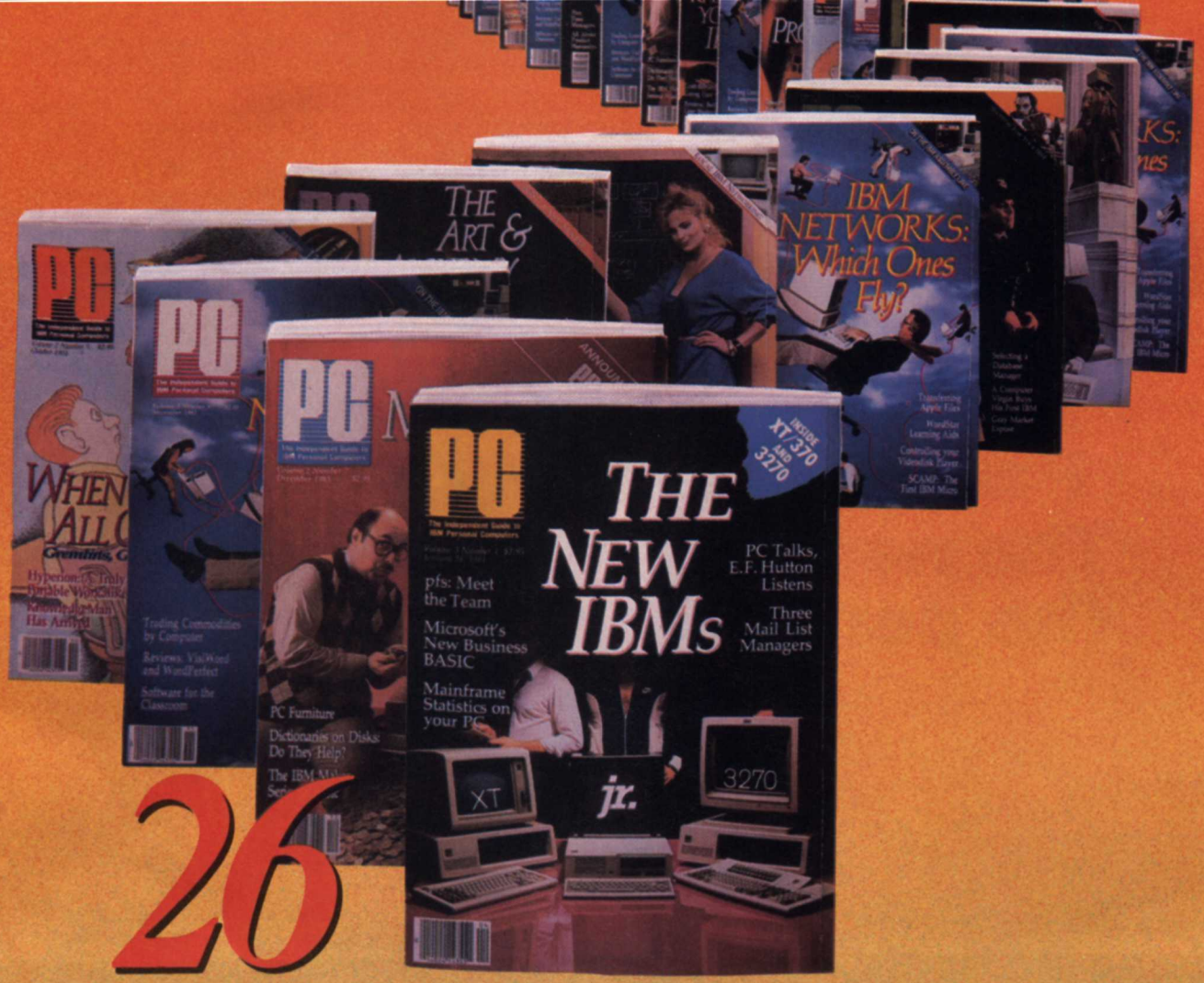
```
! " # $ % & ´ ( ) * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [ \ ] ^ _ `
a b c d e f g h i j k l m n o p q r s t u v w x y z { | } ~
§ £ ¨ ç ¢ ¬
This is a sample of Courier 10, the standard Juki typeface.
Notice that the character set is ASCII standard.
The 6 characters in the last row must be printed using ESCape codes.

This is a sample of Caroll-OCR 12, a Triumph-Adler typeface.

This is a sample of Mini-Tile 12/15, a Triumph-Adler typeface.

This is a sample of Madeleine Proportional, a Triumph-Adler typeface.
```

Figure 1.



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CIRCLE 154 ON READER SERVICE CARD

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This is a test of double striking.
This is a test of bold printing.
This is a test of underlining.
This is a test of shadow printing.
This is a test of changing to 12 pitch.
This is a test of striking out.
This is a test of superscripting and subscripting.
```

Figure 2.

The manual indicates that the printer will recognize the end of a ribbon and pause for a ribbon change, but this feature is not fully functional. The printer recognizes only the very end of the ribbon, well past the inked portion. Because the printer will merrily continue printing after the ribbon is used up, paying careful attention to the amount of ribbon left is critical.

At the rear of the printer are the ON/OFF switch, three-prong power cord, and the standard 36-pin male Centronics parallel connector. A serial interface board is a $60 option.

Printing impression is set by DIP switch to either low or high (the Juki can handle an original and three carbons). Other DIP switches are used to choose a linefeed or no linefeed with carriage returns, the type of international character set used (eight are available), continuous or cut sheet paper, 11″ or 12″ form length, six or eight lines per inch, and curiously enough, whether or not you are using an IBM PC. The DIP switches, placed just inside the cover behind the front control panel, are easy to reach.

Printing Options and Features

Print features include superscripting, subscripting, double-striking, bolding, underscoring, and shadow printing (see Figure 2). The registration is accurate enough that double-striking and bolding (striking the same location three successive times) are barely noticeable. The shadow print is bold, attractive, and distinctive.

This printer seems capable of anything my software can throw at it, and then some. The maximum paper width is 13″, with an 11″ print line. The print line is good for 110 characters in 10 pitch and up to 165 characters in 15 pitch. The proportional mode prints from 82 to 220 characters per line. Under software control, you can also change the between-character spacing to obtain almost any pitch desired.

In graphics mode, the Juki is capable of 120 by 48 resolution. This is good enough for some limited graphic applications such as line charts, but high resolution still calls for a dot matrix printer.

Full control over the printed page is allowed. You may set, through your software, top, bottom and side margins, tab stops, and line spacing. If desired, you may also change the print head path from bi-directional to uni-directional.

The Juki offers a standard 2K buffer, expandable to 8K. The manual lists the designations of 10 different RAM chips that may be used by the do-it-yourselfer to expand the buffer. While the manual cautions that the installation should be performed by a dealer, it is nice to have the information available.

A bi-directional tractor feed is available as an option, although if you are careful when lining up the feed path, continuous-feed paper can be used with no slewing. I have printed documents of over 15 pages in this manner with no noticeable variation in margin alignment.

Conclusion

The Juki 6100 is a well designed and well executed daisywheel printer. In a feature-by-feature comparison, the Juki outstrips anything in its class. The availability and price of ribbons is a very significant feature, as are the expandable buffer, auto paper load, multiple pitches, low noise, excellent documentation, and print quality. I have only two real complaints about the Juki: one, that it doesn't use a more standard brand of printwheel, and two, that the end-of-ribbon feature does not function as it should.

Because of its low noise and sturdy construction, this printer is a good choice for the office as well as the home. The Juki 6100 will be well received by anyone needing a high quality, low cost, light to medium duty letter quality printer. In fact, you may find, as I have, that the Juki 6100 is all the printer you need.

Very nice job, William. Perhaps we shall be hearing more from you in Print About Printers.

Next month we will continue our new products information, as well as evaluate the Star Micronics Delta-10 and the NEC Spinwriter 2050. So until next time, try to stay near the top of form. See you then! END

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creative computing

HARDWARE PROFILE

Product: Juki 6100 printer

Type: Daisywheel printer

System: Compatible with most computers

Print Speed: 18 cps (17 cps Shannon text, 10 pitch)

Printwheel: 100-character, Triumph-Adler compatible

Ribbon: IBM Selectric compatible Single-strike—160,000 characters; Multi-strike—480,000 characters

Carriage: Platen Length: 13 inches
Print Line: 11 inches

Dimensions: Width: 20.5 inches
Depth: 14.2 inches
Height: 5.9 inches
Weight: 27.5 pounds

Performance: Outstanding

Ease Of Use: Excellent

Documentation: Excellent

Price: $699

Summary: A sturdy, high-quality printer designed for light to medium duty.

Overall Mark: Excellent

Manufacturer:
Juki Industries of America, Inc.
299 Market St.
Saddle Brook, NJ 07662
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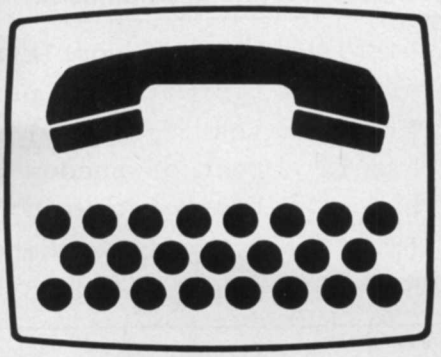
CIRCLE 493 ON READER SERVICE CARD



Telecommunications Talk

Brian J. Murphy

It is the time of year when students begin to count the days until the end of the school year. Starting in May, colleges all over the country conduct their commencement exercises and also let loose the lower forms of life—the undergrads.

When I was in college, the end of the term couldn't arrive too quickly. Never enthusiastic about classroom learning, I avoided the lecture hall whenever possible (commensurate with receiving a decent grade). Needless to say, this system didn't always work. Cutting inevitably means you miss important material (albeit material sometimes hidden deep within the dusty verbiage of the lecturer's presentation) that will appear on the final. The stuff you cut always does.

You can probably guess what I am leading up to, college without classrooms, college without set class times, college via telecommunications.

College Over The Phone

One might imagine that by now there would already be dozens of schools which offer full college credit courses through the medium of computer telecommunications, the idea being so attractive and logical. Surprisingly as it turns out, college courses by telecommunications is an idea which is still in its infancy. As of this writing no college or university (that we are aware of—and we have looked) has announced offerings of courses for college credit toward an undergraduate or graduate degree through the computer/phone medium—but all that may change soon.

At the New Jersey Institute of Technology seven calendar years of software design and eighty man (and woman)-years of programming work has borne fruit and is now on line. NJIT's computer teleconferencing system called EIES (the Electronic Information Exchange System—you pronounce the acronym "eyes") is up and running. The school used it this year as the medium for 14 complete continuing education seminars.

A seminar conducted on a computer telecommunications system is profoundly different from one offered in the conventional classroom setting.

EIES was developed by a NJIT professor of computer science, Murray Turoff, who began design of the system in 1976. EIES went on line in 1983 with a short series of continuing education seminar offerings which attracted the attention of educators and institutions both in the United States and overseas and the participation of students in geographic areas equally as diverse.

As you might imagine, a seminar conducted on a computer telecommunications system is profoundly different from one offered in the conventional classroom setting. One big advantage is that limitations of time and location have been virtually annihilated.

Dr. Turoff points out that the offering of courses via computer allows people whose business and/or professional commitments would otherwise prevent participation to join in a seminar group. He says that this benefit has attracted the participation of a significant number of executives in high management positions; this is a chance for them to benefit from professional enrichment courses which they otherwise might not be able to take.

Another difference between the formal classroom and the computer classroom at home is that participation among members of the group is more widespread than in a conventional class setting. Joyce Fedak, associate director of the NJIT Continuing Education Division, says that the EIES seminar conferencing system allows students to see each other's answers to questions and remarks in "discussions."

In the traditional classroom, once a question has been answered, the topic is effectively squelched. In the EIES environment, when the instructor asks a question, it is answered by the group members in the privacy of their homes and offices over the course of some several days. No student can see the answers of the other members of the group until he has keyed in his own response to the question. After a response has been sent, the individual can read all the other answers received to date.

Fruitful Discussion

This system encourages participation and stimulates curiosity. Another advantage of this system is that it allows for anonymous answers. The shy student

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CIRCLE 148 ON READER SERVICE CARD

can feel more comfortable about participating in this setting, and the group member who wishes to try out a radical or unusual idea may do so without fear of embarrassment. Using this system, the ideas under discussion are more fully explored by the group as a whole.

Suppose, for example, that a seminar in management took up the topic of how to evaluate computer systems in light of business needs. Let us also suppose that a member of the group is an executive whose contribution to the discussion concerns a costly mistake he or his company has made in buying an inadequate or inappropriate system. Cloaked in the anonymity of the program, this executive can frankly and fully explore the reasons for this error with the other members of the group, and the resulting discussion will give all participants a much better idea of why the failure occurred and how to avoid it than any face-to-face forum ever could.

Speaking of dialogue, let it be noted here that the discussion is not limited to the context of the topic as defined by the instructor. EIES contains an E-Mail feature which allows the participants unrestricted communication with each other and with the instructor. The system notifies the user immediately at logon of any E-Mail waiting for him and provides the options of looking at the messages at once, deferring reading, or just scanning the topics of the messages.

Time For School

Let's change course for a moment and explore the system feature which allows group members to schedule "class times" to suit their own needs.

The group member does not have to be sitting at his terminal or computer at a specific time to participate in the class (although EIES is capable of supporting an on-line conference of class members which could be scheduled for a specific time). As we noted earlier, the business or professional user whose schedule may fill every working day to the brim, or whose schedule may fluctuate unpredictably from week to week, will like this feature.

Whenever he finds time to access the system, the current lesson or discussion, pre-prepared by the instructor, will be waiting. The user may find that other members of the group have already responded to the topic under discussion—and that the instructor has issued replies—all of which the user may peruse once he has added his contribution. If the user prefers hard copy, he has the option of downloading the seminar material and dumping it to his printer. Then the lesson can be snapped into his briefcase and taken wherever he may go.

Writing the papers is another matter. It is easy enough to type out a term paper, but it can be a little difficult to get the essay to go over the phone lines unless you have used a word processor to compose it. If the student's computer system includes word processing, fine. He can simply upload the text into the EIES system. If not, or if he doesn't have a smart terminal, EIES comes equipped with word processing of its own, which allows him to write the composition and store it as he goes along.

There are no tests or quizzes as such as the seminar courses progress, and no grades. This, combined with the fact that the user can access the course whenever he likes—meaning he can put off the access as long as he wants—places the motivational burden on the user. He must be disciplined enough to say, "I'm going to use this free time I have to work on the seminar materials."

This is what a mature executive, who has invested $525 of his or his company's money in the seminar, says. What will be the attitude of the undergraduate in the same situation? Undoubtedly some will procrastinate and fall behind, but I think most will stay current in their work. It is likely, also, that the setup for college credit courses on the undergrad and graduate levels will be a little stricter with regard to when student feedback is due.

The group member does not have to be sitting at his terminal or computer at a specific time to participate in the class.

Of course, undergrad courses by computer are still in the future, but the day when we shall see such a system in actual operation is probably not far off. Dr. Turoff says that a proposal to fund research on the design and programming of a system similar to EIES for use in credit courses is being considered by a "major foundation" and that he has high hopes that there will be a grant issued soon.

Nuts and Bolts

Here are some basic facts about the system, in case you want to participate.

The courses are available through the Division of Continuing Education at NJIT, (201) 645-5235 (voice). Tuition for one three-month seminar is $525 with additional fees for EIES membership ($225 per seminar), texts, and connect charges. You can connect by direct dial through Ma Bell or through the Telenet or Uninet systems.

Hardware requirements are minimal. Any micro that uses ASCII characters and which is equipped with a modem capable of 300 or 1200 baud operation will do. Any ASCII terminal capable of these speeds is also okay. If you don't have a micro or terminal, you can lease one (a CDI Miniterm) from the school for $50 a month.

Once you are on-line, the system offers support and aid to get you over the rough spots. Sysops are available most times between 6:00 a.m. and 10:00 p.m. If you are really stuck, a "???" message followed by 135 characters describing what is wrong will bring help.

You can get course titles for the Fall '84 semester directly from NJIT.

System Security

The following is a letter (sans the sender's name) which I received in response to our first Telecommunications Talk column (January 1984):

"I enjoyed and agreed with your article on invasive hacking in the January *Creative Computing*.

"I would like to understand why organizations don't use the most simple type of security, that of the callback! While this does nothing about internal misuse . . it effectively eliminates the typical hacker calling from his home telephone. Why?"

To answer this question and to follow up on the January story, I called Claudia Houston at Telenet. Telenet is very concerned about the security problems that its members have been experiencing. If the computer vandals discourage businesses and institutions from using telecommunications, Telenet loses money.

Ms. Houston first defined callback security: the host computer refuses to complete the connection when first you call, but calls back your number (which is presumably on a list of approved numbers) to make the connection.

Because of the long distance charges involved—callback security systems do not work with Telenet and the other nets—the callback method is appropriate only for host computers serving a population in close geographic proximity to the host computer. For hosting long distance callers, other security arrangements are needed.

Ms. Houston offered several of Telenet's suggested security measures. As you read them bear in mind that almost any size system—even a bulletin

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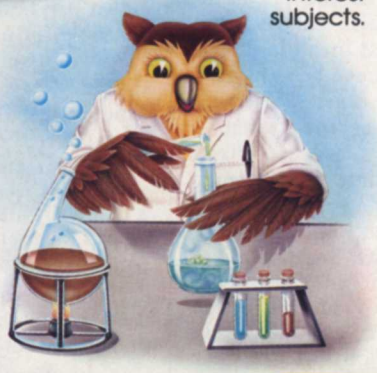

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MCI, the "Nation's New Postal System," and it's now available to AFTER DARK subscribers. Light years more sophisticated than other terminal-to-terminal services, MCI Mail also gives you options of overnight, overnight-by-noon and four-hour delivery. And if you're sending to someone without a computer, you can even have MCI print the message on their high speed laser printer and mail it from the nearest city!

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board system on a micro to which you want to restrict access—can make use of some or all of these suggestions:

- The host computer should not transmit its name until the proper ID has been transmitted by the user. A prompt saying "Hi! This is the Last National Bank Disbursement Department" sort of gives the game away, doesn't it? A prompt like that tells the intruder that the first important step in his trespass, finding the target computer, has been completed.
- Get rid of password prompts like "ID Number?" and "Password?" The authorized user should know what identification to key in and when. If you must use prompts, let me (not Telenet) suggest that it be an alphanumeric character like #,!< *, or a combination of letters or numbers. The idea is that only an authorized user will recognize the code as a prompt to input his ID.
- Before you ever handle your first user, delete all "default" access codes. These are the codes the manufacturers and installers use while they are setting up the system for you, or which you might use while programming a bulletin board or other small host system. The mainframe passwords are fairly common and well-known to hackers and anyone who knows you can make an informed guess as to what passwords you might use to program your BBS. Also, remove repairer's access codes after any repair.
- Use a double password. CompuServe's security provides a good example of this procedure. They require a numeric identification then a password using two words in a nonsense combination. CompuServe avoids using such obvious passwords as license plate numbers and birthdays by assigning the passwords themselves. Learn to mix up your access codes with letters and numbers, and use control characters and punctuation marks too.

A prompt saying "Hi! This is the Last National Bank Disbursement Department" sort of gives the game away.

- Use a time delay that will kick in once an invalid access code is given. Some hackers have software which inputs number after number much more rapidly and with more patience than any human could in the hopes that it will randomly hit a working ID. A time delay of several seconds after an incorrect ID defeats this sort of program. The delay feature should also incorporate an automatic disconnect after two or three invalid ID inputs.

The Federal government is preparing to step in with long-needed legislation to make unauthorized computer access a crime.

- Do not display password characters while they are being keyed in.
- Issue new passwords and ID numbers at random intervals. This is good security housekeeping. It invalidates any access codes that may have been pirated since the last ID was issued. When an employee or user leaves the system—especially if you suspect hard feelings—it is a good time to issue new codes.
- Use "burglar alarm" software that detects hacking attempts. Such software detects the use of a program that inputs scores and scores of possible ID combinations in hopes of completing an unauthorized connection. A burglar alarm program can be used to trace the caller or to notify your on-duty security personnel.

Ms. Houston says that it is important to have a security plan. It should be in place and ready to go when you start up your system. Telenet members who lack such a plan or who have questions about security can call on the network for security evaluations. Other nets and private companies offer similar services to their institutional customers. Private individuals must rely on their common sense. I hope these suggestions help.

Pending Legislation

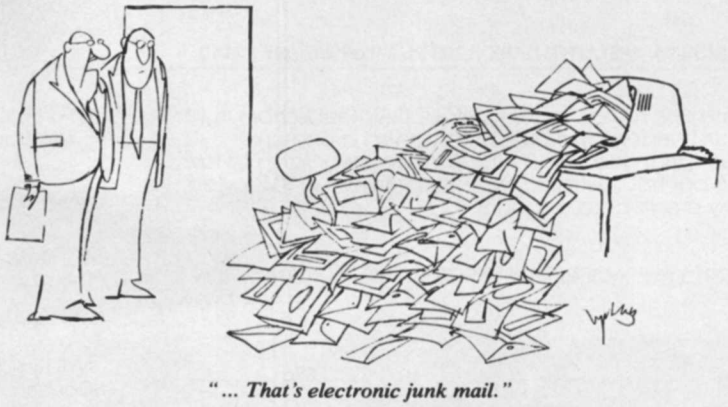
While private system users take steps to secure their computers, there is every indication that the Federal government is preparing to step in with long-needed legislation to make unauthorized computer access a crime.

A bill sponsored by Congressman Bill Nelson (D-Florida) called the Federal Computer Systems Protection Act (HR 1092) is currently under consideration by the House of Representatives. If passed into law, the bill would mandate fines of up to $50,000 and imprisonment for as long as five years for accessing a computer for purposes of theft (the penalty is a fine equivalent to two times the value of what was stolen or $50,000, whichever is greater) and for intentionally damaging a system or causing it to become partially or wholly unusable for any period of time.

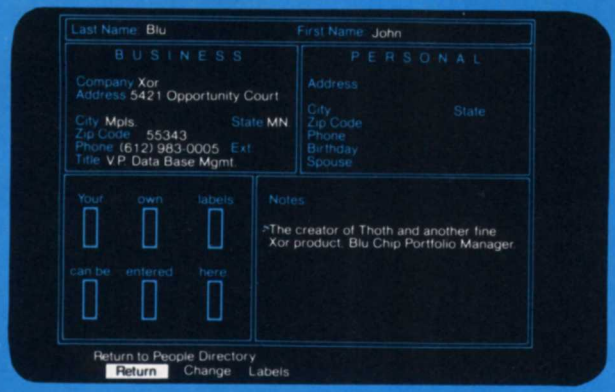
As you can see, the Nelson bill covers almost every aspect of the computer vandalism that has plagued system owners all over the country. The law will apply specifically to Federally-owned computers (such as the one at Los Alamos the 414s hacked), computers owned by Federally-insured financial institutions such as banks, securities dealers and credit unions, and computers used in interstate commerce for profit or non-profit enterprises.

According to Jim Southerland, Rep. Nelson's administrative assistant, this umbrella would include any institutional or commercial computer accessed across state lines including the Sloan-Kettering Memorial Institute's system.

The law already has the sponsorship support of 108 members of the House of Representatives and passage looks likely sometime this year.



"... That's electronic junk mail."



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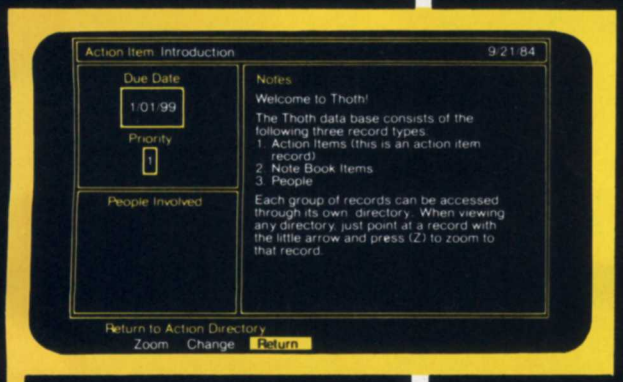

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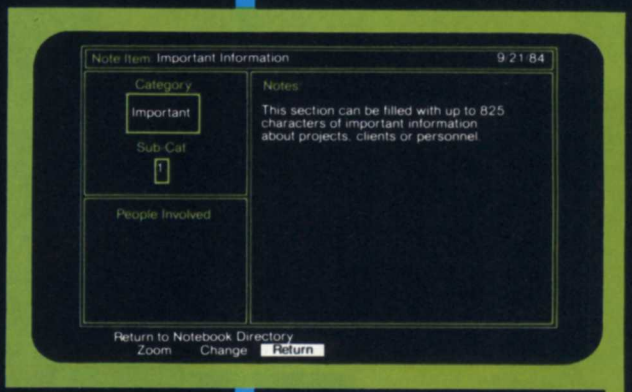

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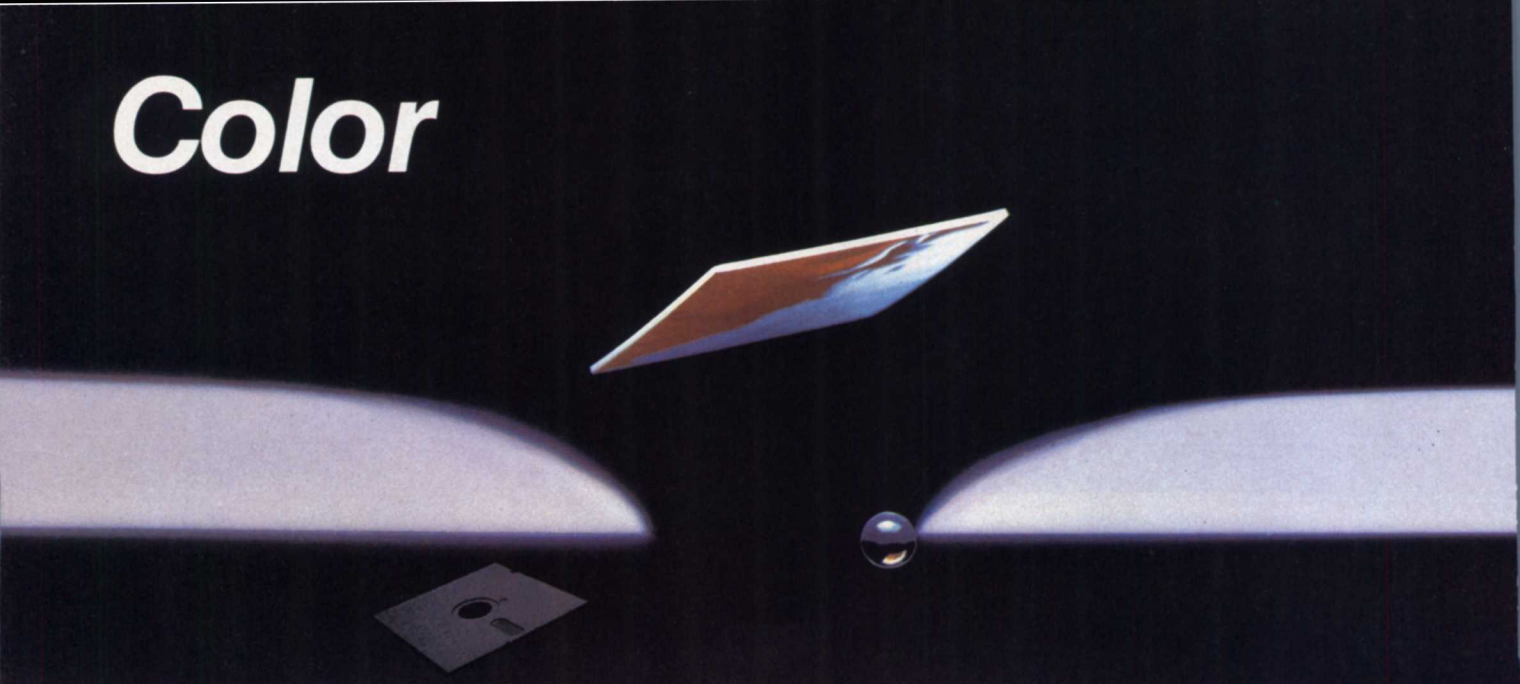
Color



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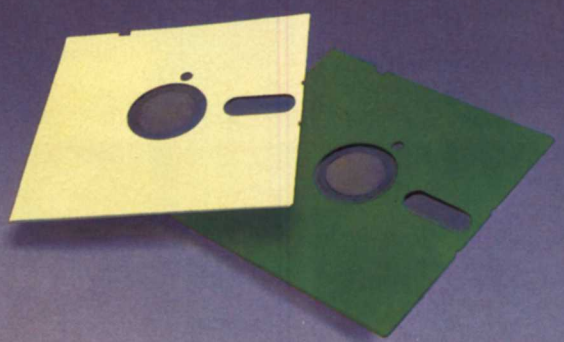

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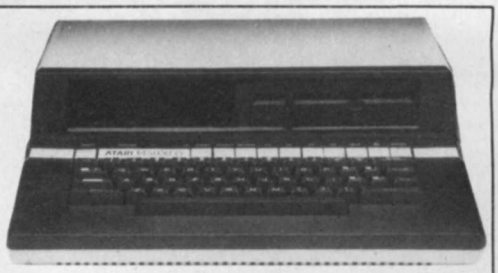


Outpost: Atari

Arthur Leyenberger

This month we have a surplus of new hardware and software to report on and barely enough room to cover everything. Therefore, I will spare you the small talk and get right down to the serious business at hand.

Atari Announces No New Product News Before Its Time

I have just returned from the Winter Consumer Electronics Show in Las Vegas. Everything I have ever heard about Las Vegas is true—and more. If Disneyland is the fantasy world for the young, then I would argue that Vegas is the fantasy world for adults. This desert *Ortgeist* was an appropriate setting for software and hardware companies gambling on their future with new offerings.

Without any "significant" new product announcements by Atari, it was difficult for me to come up with a clever title for this segment. The possibilities were: "No News is Good News," "No News is No News," and "All the News That's Fit to Print." Trouble is, the first one has a negative connotation, the second is not very catchy, and the third is already taken. All of these titles, however, do capture the essence of Atari's new posture: We have made serious mistakes in the past. They will not happen again. And we are in the home computer business to stay (including hardware).

The important Atari news of the show was their new attitude as evidenced by these and other candid remarks made by James Morgan, chairman and C.E.O. of Atari. According to Morgan, the three major causes for losing a half billion dollars in 1983 were 1) rapid and unchecked growth, 2) following the industry phenomenon of getting to the market quickly rather than strongly, and 3) subscribing to the Silicon Valley ethic of making products that are easily made rather than products that the consumer wants. (Check out the sidebar for a very frank and intelligently written letter by Morgan.)

For the future, Atari's new missions are profitability, reliability, and creativity. The steps being taken to attain these laudable goals are the reduction of overhead cost by 40%, operating the company professionally by delivering what has been promised, and critically focusing the creativity and talent of the company.

For the future, Atari's new missions are profitability, reliability, and creativity.

Atari users may justifiably be skeptical at these words since we have heard similar promises before. As far as profitability and creativity are concerned, we will have to wait and see what Atari offers in the future. In terms of reliability, however, a local retailer who sells Atari computers and software has told me that out of the 100 Atari 800XLs he has sold so far, not one has been returned as defective.

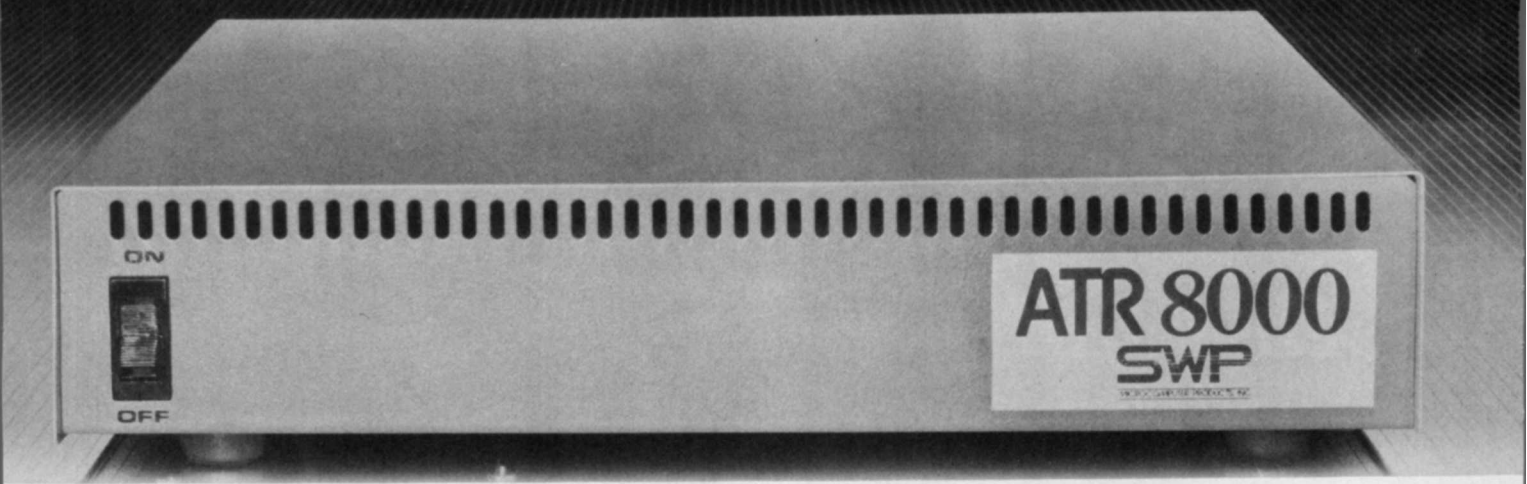
There is no denying that Atari intends to make the 600XL and 800XL the workhorses of their computer line and their ticket to financial recovery. The key is making a reliable computer that is compatible with the thousands of existing programs. This has already been accomplished with the Translator disks.

There is also no denying that James Morgan is at the helm, and he should be given credit for being a quick study, especially having come into a new industry. The Atari ship was so far off course that it will take time for Morgan's assessment and new direction to be seen. Having attended a meeting with James Morgan, I think it is obvious that he has a game plan. Although no new computers were announced at the show, there was evidence to suggest that Atari is about to make a comeback.

One example of this is a new game called *The Legacy*. A result of a six month effort in Atari's Advanced Games Research Lab (I did not even know they had an *advanced* games lab), *The Legacy* is the first of the next generation of video games. These games are designed with the home user in mind and therefore take advantage of the home environment.

The Legacy is not a shoot-'em-up or an arcade clone but, rather, an original game that combines separate interactive game modes. It takes place in a world decimated by nuclear war. All that remains are toxic wastelands known as the dead zone and a handful of survivors. Although the survivors are attempting to rebuild the world, they learn that the original holocaust is not complete. A computer error has made a follow-up attack imminent. The player's goal is to pi-

CP/M and MS-DOS Compatibility For All Atari Computers



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- Double density CP/M 2.2.
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lot a technologically advanced ship on a mission to find and destroy the missile silos.

This game is totally different from the usual game fare to which we have all become accustomed. Strategy and timing are the important ingredients here.

Software From Synapse

Atari's most significant software news was the announcement of the trilogy of home management programs purchased from Synapse. Originally introduced by Synapse at CES in June, the products include database, spreadsheet, and graphics programs. *SynFile+* is the database program that is the successor to the popular *Filemanager+* program. However, the name of the product and the company who produced it are the only similarities with the older program. *SynFile+* has been entirely rewritten in Forth and completely restructured. The specs are impressive: up to 16 files may be opened at once; 66 fields per record are allowed; thousands of records may be maintained in a file; table look-up capability; and compatibility with *Filemanager+*, *Atariwriter*, and other "Syn" products. Very impressive to be sure.

Another program in the series is called *SynCalc*. This is a menu driven spreadsheet program that offers individual column widths; special format options like comma insertion and centering; multiple spreadsheet linking; and compatibility with *VisiCalc* format files. Logic, sorting, and financial functions are also supported.

Atari's most significant software news was the announcement of the trilogy of home management programs purchased from Synapse.

The third package is called *SynTrend* and is composed of two parts: Syngraph and SynStat. Based upon my hands-on use, I would say that this package is "Synsational." Compatible with the other products in the Syn series, *SynTrend* can produce bar, pie, line, and scatter plots. The program is menu-driven, and compatible with *VisiCalc* files. It supports multiple disk drives. Also included are descriptive statistics and multiple regression analyses. Each of the "Syn" programs distributed by Atari retails for $99.95.

Other software announced by Atari included the *Music Learning Series*, a new Disney video adventure called *Captain Hook's Revenge* and DOS 3 for the dual density 1050 Disk Drive. DOS 3 is now packaged with the 1050 and will be given free to all current owners of the drive. This is yet another indication that intelligent life exists at Atari.

Hardware?

There was hardly a surfeit of hardware news, but that is consistent with Atari's new policy of not announcing products until it can deliver them. I applaud this strategy and wish more

Atari's Morgan: Frankly Speaking

The following unedited letter written by James Morgan, Atari CEO and Chairman of the Board, originally appeared in the message section of Compu-Serve. It is reprinted here by permission of Atari, Inc.

For the past several months, you have been Atari's harshest critics . . . and rightly so, since you are also Atari's most sophisticated users. I am impressed by your passion of convictions as well as your passion for Atari. Without getting too specific, I'd like to address some of the major issues you have been raising.

First of all, Atari has been in financial trouble during most of 1983. With that position comes a need and responsibility to re-examine every decision and program which led to the situation. Clearly, in relation to its ability to design, manufacture, and distribute, Atari was in way over its head with a computer product line as inclusive as the 600XL, 800XL, 1400XL, 1450XLD, and 1600. The company simply didn't have the resources to execute each of these as excellently as you or other customers would rightly expect or demand. The history of the home computer market seems to me to be the spirit of broken promises—either products which don't live up to expectations, don't arrive on time, or both. We are trying to become a more reliable company which delivers on time a product that offers a meaningful and useful difference to the consumer. To do this requires walking before you run and that's what we're doing right now by selling the 600XL and 800XL while we evaluate the most appropriate definition of our next entry.

You are, as a group, pretty much on the leading edge of computer users and I doubt whether the average consumer could fathom the nuances of the products you have been describing as ideal. At the risk of alienating you, let me also say that I doubt in the short term whether we will be able to offer a product that will really turn you on. Longer term, however, our goal is to bring to the marketplace a microprocessor which is as unique as was the VCS when it was first introduced. You might be interested to know that we have formed a group led by Ted Hoff and Alan Kay which is chartered to define our next generation of computers.

Out of this group, we are hopeful, will come the unique product described above. In the meantime, we will have to keep our product line rather restricted to broadly saleable products.

If you'd like to input the Hoff/Kay group with any ideas, please send them to Bill Cabeche, who will forward them to me.

In the meantime, we both ask you for your continued support and interest, which ultimately are our most valuable assets.

I'll continue to read your messages, learn from them, and hopefully be able to read about a better and more reliable Atari in the months and years ahead.

—Jim Morgan
Chairman and CEO, Atari Inc.

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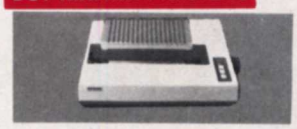

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CIRCLE 132 ON READER SERVICE CARD

companies would follow suit. The 600XL, 800XL, and 1450XLD computers were on display. But the long-awaited 1450 was, in Morgan's words, "exhibited only as a demonstration of the company's intent to market a high-end computer in 1984, although the specifics of such a product are currently under review." Absent from the hardware catalog was any word about AtariTel. As Morgan explained it during an analysts' meeting, the first AtariTel product is somewhat lackluster. Rather than introduce the line with a thud, the second, more exciting product, will be announced as the first entry during the second half of the year. We are asked to go along with this switcheroo because the product is said to be worth the wait.

Other hardware news included the announcement that the Touch Tablet and *AtariArtist* software will be shipped in the first quarter. I can vouch for this, having been using one for almost a month. It lists for $89.95, and the software is similar to that of the Koala pad.

Atari also demonstrated its light pen peripheral and *AtariGraphics* software. This light pen is the best I have seen for the Atari. It is manufactured by Gibson, the makers of the high quality, expensive light pen for the Apple computer. The Light Pen sells for $99.95 and will be available during the first half of 1984.

Atari also finally announced the 48K memory upgrade for the 600XL computer. Called the 1064 Memory Module, it is expected to sell for approximately $100. It gives full 64K memory to the 16K Atari 600XL computer.

Atari once again showed the AtariLab electronic science kit for the home computers. Developed by Dickinson College, the AtariLab peripheral allows various probes and sensors to be connected to the Atari computer. Data can be collected manually or automatically and can then be analyzed and displayed. The AtariLab Starter Set sells for $89.95 and includes the interface and temperature module. It is ready to ship now. Additional modules, the first of which is the Light Module, will sell for $49.95.

For the hard core Atari user awaiting news of MS-DOS compatible computers, CP/M boxes, and other fancy hardware, the news from Atari at the winter Consumer Electronics Show is disappointing. But for the Atari user seeking future products from a company that many thought would be out of the computer business by now, the news is relatively good. James Morgan has been in command for only four months, and there are already signs of change in Atari's business strategy.

The advanced games R&D lab mentioned above is a healthy sign. The new policies of not announcing new products before they are ready and re-assessing the markets in which the company wants to compete are also positive. And, we will soon (finally) see the Syn software series.

Although Atari displayed very little hardware (outside of the AtariLab) at the show, all things considered, 1984 should prove to be a very interesting year for Atari users. To the predictors of doom for Atari, I quote the immortal words of Yogi Berra, "it ain't over 'til it's over."

Software Movies?

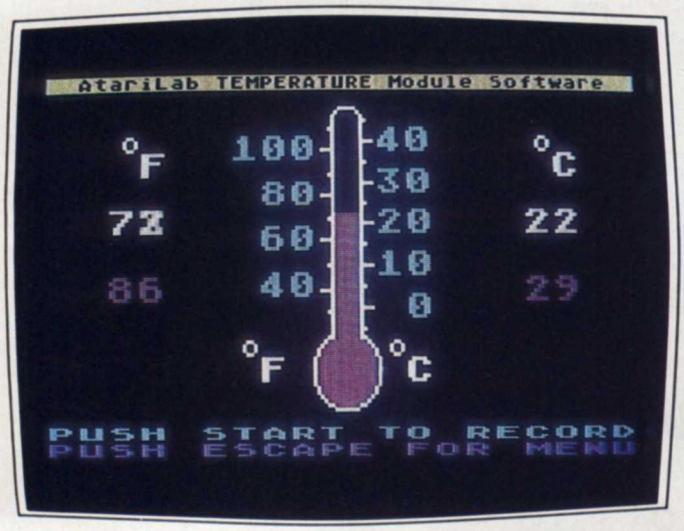
The Atari computer is a versatile machine. Among its many strengths is the ability to combine audio from a cassette recorder with graphics generated by a program. This is accomplished on the Atari 410 and 1010 recorders by storing audio on one track of the cassette and digital data (programs) on the other.

Although this approach has great potential, especially for educational material, it has not been used often. Maximus, a company new to the software business, has introduced two products that use this technique effectively. Called Software Movies, these programs tell a story by using the audio track for narration and presenting cartoon style animation on the screen.

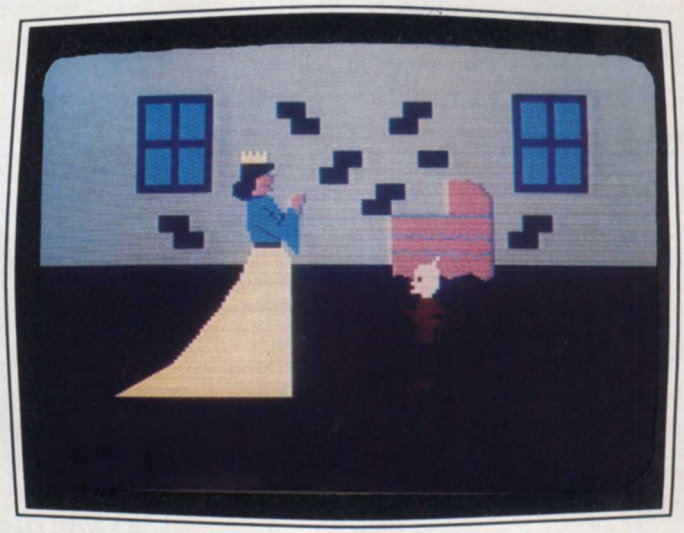
One program is called *Safetyline.* Here, Max the Cat narrates two stories with a safety theme. One story concerns crossing the street safely, and the other stresses the importance of not getting lost or talking to strangers. The stories are presented just like movies with scrolling title credits, interesting plot, and cute animation.

Additionally, there are two games associated with each story. These games are fun for the child and reinforce the lesson in the story. For example, the Street Cross game requires the child to get Sam, Max the Cat's friend, to school safely. Quickness counts, but points are deducted for trying to cross in the middle of the street. Throughout the game, safety tips are provided. These tips are also summarized at the end of the game in an unusual and clever way.

The other Software Movie is called *Storyline.* Here, Clover the Clown presents two familiar fairy tales: Rumpelstiltskin and The Ugly Duckling. Both stories are told well and should hold a child's interest. One of the games associated with Rumpelstiltskin is called Promises, Promises. The lesson of not making promises that you cannot keep is taught within the game context. I know many adults, myself included, who could benefit from this lesson as well.



AtariLab.



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CIRCLE 152 ON READER SERVICE CARD

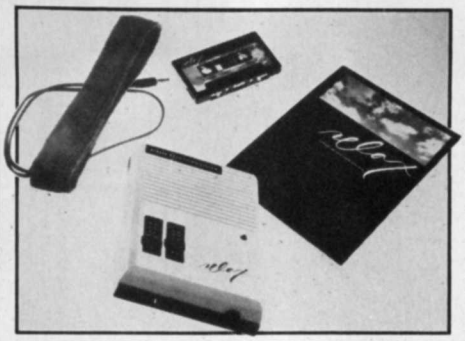
Overall, I like these Software Movies. My only criticism is that the animation does not use the maximum graphics potential of the Atari. Perhaps future releases will. Also, there are times when there is no action on the screen even though the narration suggests that there should be. This is because the program is waiting for sync marks from the tape.

These minor criticisms aside, Maximus's Software Movies are a novel approach to storytelling and will delight children in the 3 to 7 year old range. I look forward to future "movies" from Maximus. Both programs require 48K memory and are available on either disk and cassette or cassette only versions.

So What Else Is New

Synapse was showing what turned out to be the most interesting product of the show. A combination biofeedback monitor and graphics display, Relax is intended to help the individual relax and reduce stress. It is the first of a series of products to use the capabilities of your home computer to monitor and improve your health. *Creative* will have a thorough review of this interesting and unique product in the near future.

Other new Synapse products for the Atari include *SynChron* (a personal calendar), *SynComm* (a telecommunications program), *SynStock* (a stock portfolio analysis program), and *SynTax* (a federal income tax preparation program). These products will be available during the first quarter and will retail for $34.95. *SynStock* will sell for $49.95. All seem easy to use and powerful.



The Relax System: Headband, Training Tape, Workbook, and Interface.

Dimension X, originally shown at the Summer CES last June, will finally make its debut during the first quarter of 1984. Having undergone several revisions, the incredible 3-D action is still present. You navigate over the surface of a planet, piloting a hot rod skimmer, finding, and destroying all enemy skimmers.

CES would not be CES unless Atari had some new game titles on display. In addition to *The Legacy* mentioned above, some other exciting titles will soon be released. *Berserk,* which should be in the stores by the time you read this, is a highly playable game. Much like its arcade namesake, it offers an unusual feature for a home video game: speech. In a voice similar to but much better than the voice in Atari's E.T., such expressions as "Fight like a Robot" and "Intruder Alert" are heard. The game play is excellent.

Other games announced for the computers by Atari were adaptations of Mario Brothers, Robotron, and Donkey Kong Jr. All are slated for second quarter release. END

Firms Mentioned In This Column

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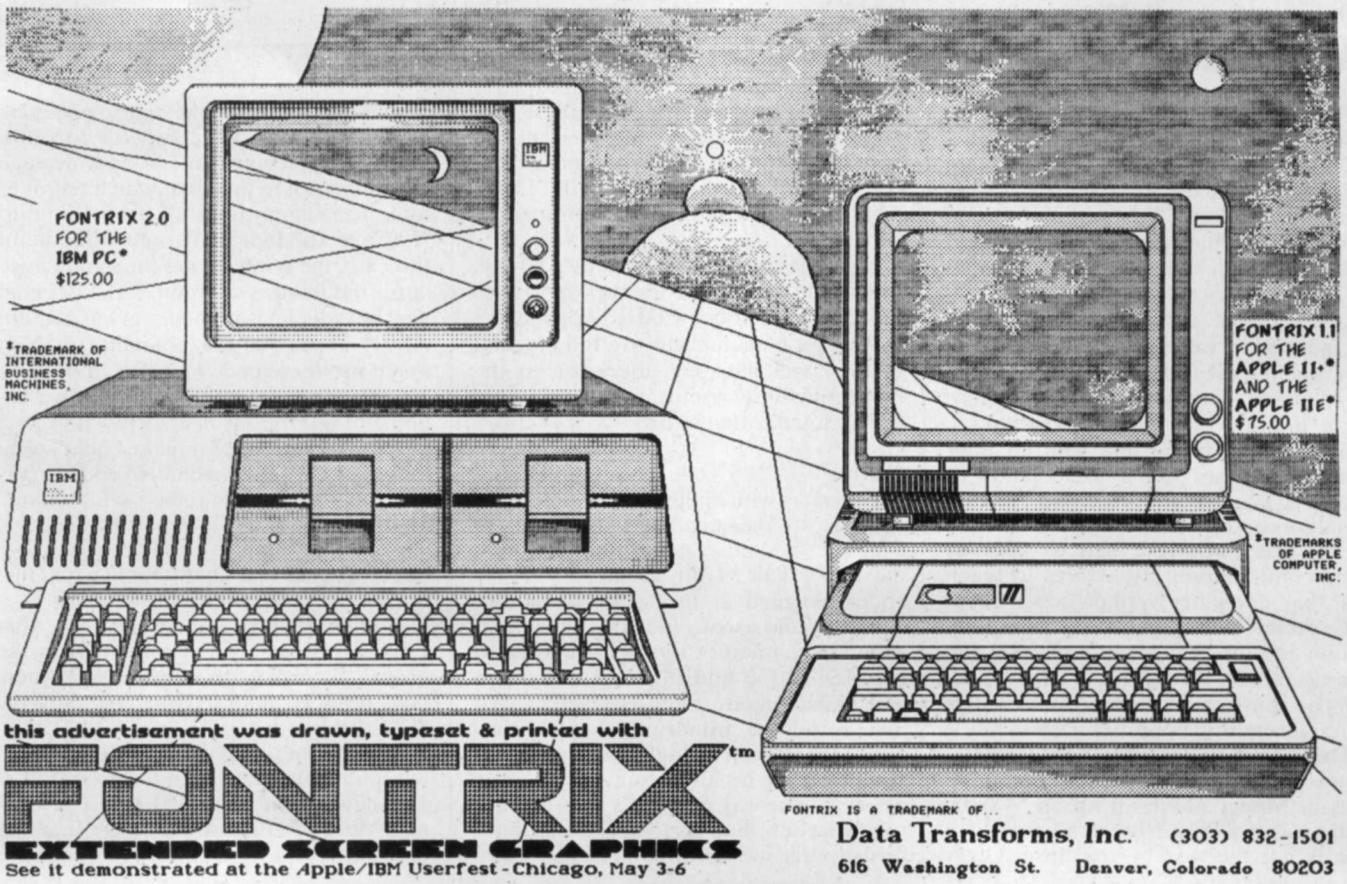

CIRCLE 124 ON READER SERVICE CARD

Notebook/Portable Computing

This month Luft Pfeiff acts as guest columnist and provides a tutorial on embedding printer control codes in Model 100 or NEC 8201 text files. —JJA

Luft Pfeiff

Wouldn't it be nice if the Text word-processing program in the Model 100 and 8201A had provided more of the goodies we have come to love in the more advanced word processors running on our bigger computers? Italics, emphasized print, double-width print, underlining and the like have become second nature to many of us. We are also used to setting header or footer lines to be printed on each page along with automatically incremented page numbers. We have been typing in commands that adjust page length, column width, and many other parameters. About all Text provides are the editing functions of insert, delete, cut, copy, and paste. At the main menu we have a LIST or PRINT function that asks first what column width we want and then dumps our purple prose to the printer, otherwise unformatted.

Fancy word processors with all their control functions use a combination of operating system, print firmware, and internal subroutines to perform their mighty tricks. You may have had to perform some configuration procedures to teach your "big" computer word processor about the special features of your operating system and the printer you use. You can also do this on the 8201 and Model 100, but you must embed the printer control characters within your text files.

The procedure described here illustrates how to send control characters from an 8201 or Model 100 to an Epson MX-100 with Graftrax Plus. Now don't despair if that is not the system you have. Other printers work similarly, but you will have to look up the control codes. If you have a different printer, you shouldn't find it too difficult to translate these procedures into ones that will do the same thing for you.

These procedures will work with the built-in 8201 or Model 100 Print routine as well as with some of the third-party text editing programs. Some of these programs trap the escape codes, so you will have to experiment a bit. These embedded codes work especially well with David Ahl's FORMAT program (distributed by NEC).

If you have your printer manual handy, this would be a good time to open it to the table of Control Codes. Appendix B in my Epson manual has two full pages of these. I will limit my discussion to the codes obviously useful in our more and less serious writing efforts.

Italics

Let's start with italics as an example. In contrast to the standard ASCII set of character and other codes from 0 to 127, the upper half of the range to 255 has codes assigned at the whim of system designers and usually includes many non-standard characters. Epson has chosen to use ASCII 160 and up to print symbol and alphanumeric italic characters. We need to tell the printer somehow that we want italics even though we have typed the keys that usually result in non-italic printing. The way to do this is to throw a toggle switch that says "everything until further notice will be printed italic." There is a DIP switch that does this right inside the machine, but we want to use a software switch as it is easier to get at. This switch is given in the Control Code listing as shown in Figure 1.

	Dec	Hex	Symbol	Function
<ESC>	53	35	4	Italic character set ON

Figure 1.

This tells us that, in the course of getting characters from our computer to print, the printer receives an ESCape message which it is not to print but which tells it to look for the symbol of something to "ESCape to" indicated right after it. In this case, the symbol 4 has the significance "turn the italics switch on." The decimal and hexadecimal numbers given are the ASCII codes for the character 4. You might use these code numbers in Basic or other language programming but we are going to use the "4" *neat*.

There, I just did. To make "neat" print as "*neat*" I typed two control codes in my text, one to turn the italic switch on and another to turn it off, in particular:

ESC4neatESC5

(ESC takes up one character in a text file, but it does not print on the screen.)

You must have guessed by now that ESC5 is the off switch for italics in the gospel according to Epson. Well then, how do I go about telling my MX-100 "ESCape by route 4"?

It turns out that there are two ESCapes recognized by the Epson—one is ASCII 27, and the other is ASCII 155. The NEC and Model 100 know about the first one and think that its ESCape messages are

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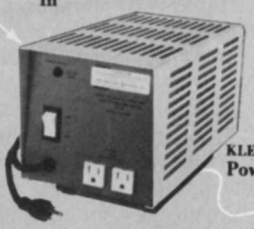

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for them. As a result, you can't use the key marked ESC. However, code 155 also means ESCape, and it is not intercepted by the computer.

ASCII 155 can be keyed in on the NEC by pressing and holding the GRPH key down and then pressing the \ (backslash) key (GRPH-K on the Model 100). On the Model 100, this shows on the screen as a left arrow character; the NEC shows a space on the screen (not handy). It takes some sleuthing to uncover such facts and, of course, to do that you need to know that there is something there worth looking for. There is no telling what may show up on your display when you do this. It may be nothing, a Japanese Katakana character, or a graphic symbol left over from the last game you were playing, depending upon what programs you have been running. If you have an 8201, you should determine which codes you will be using and, with the CHRDEF program, but appropriate symbols in the ASCII character table. I used two carets (up and down) to indicate ESC. By the way, if you have not received NEC's update to CHRDEF.BA, you should ask them for it.

Subscripts

Take a look at Figure 2, which shows the various ESCape inputs and their results. They are all achieved in the same way as the italics. Not everything in the table in the manual can be done. Some of the codes simply do not respond; others go only halfway. The latter are mostly those that expect an additional signal such as a 0 or a 1 following a letter. ESC-S is one. ESC-S-O should place the printer in the superscript mode and ESC-S-1 should put it in the subscript mode. As it turns out, both evoke subscript because neither the 0 nor the 1 takes effect. ESC-S alone produces subscript. One character after the S *is* read, however—so unless you put the number in or leave a space, the first character of your subscript will be gobbled up. A similar thing happens with other codes that use a number to select or toggle a condition. In addition, those codes that require additional numbers as parameters will not respond as you would like.

Underlining

An example is the combination ESC-1/ESC-0 for underline on/off. (In all my examples I use 1 where Epson specifies >0.) Either of these codes plus just ESC turns the underline on, but then the problem is to turn it off. There is no good way, but there *is* a way. That is to reset all the printer defaults by sending ESC-@.

The problem with using this sequence to turn off the underlining is that ESC-@ cancels all input before it in a given line. That means that you can't underline a single word or a few words in the middle of a line. However, an entire line is easily underlined as are words that fall at the end of a line. The underline mode is turned off by entering ESC-@ just after a carriage return at the end of the underlined material.

ESC-@ is a valuable code. It is equivalent to turning the printer power switch off and on to set the default conditions as selected by the DIP switches. And, just as your big league word processing program probably "initializes" the printer, if you follow ESC-@ with other codes such as ESC-E for emphasized print, ESC-4 for italics, ESC-9 to enable the paper-out sensor and ESC-U for unidirectional printing, you can do a great deal of initialization from within Text.

Other Codes

If it sounds as though there are many things you can't do, just browse through Figure 2. You will see, in the latter half of the table some controls that do not use ESC.

These controls are labeled "GRPH-something" just as GRPH-\ was for ESC, but they call other functions directly. ASCII

This is an example of normal print.

ESC-E turns on Emphasized Mode

ESC-F turns off Emphasized Mode

ESC-G turns on double strike mode

ESC-S-1 turns on subscript

ESC-H turns off double strike and subscript

ESC-U continuous unidirectional printing

ESC-< one line unidirectional printing

ESC-T unidirectional and subscript off

ESC-4 turns *italics on*

ESC-5 turns italics off.

ESC-0 sets line spacing to 8 lines per inch

ESC-1 sets line spacing for no separation

ESC-2 sets default line spacing of 6 lines per inch

ESC-8 disables paper-out sensor

ESC-9 enables paper-out sensor

ESC-1 turns on underline mode

ESC-@ resets all printer defaults

GRPH- ESCape in all above codes

GRPH-A BackSpace as in bGRAPHA/ = ⌫

GRPH-S Horizontal Tab

GRPH-D Line Feed

GRPH-F Vertical Tab

GRPH-G Form Feed

GRPH-H same as RETURN/ENTER key

GRPH-J Double width, one line only

GRPH-T Double to normal width

GRPH-K condensed width, continuous until canceled

GRPH-J GRPH-K condensed double width one line only, condensed must be canceled

GRPH-E condensed to normal width

GRPH-L sounds printer bell unless bell disabled by DIP switch

GRPH-X £ British Pound symbol

GRPH-C ¨ dieresis

GRPH-V ´ acute accent

GRPH-B ` grave accent

GRPH-N § section sign

GRPH-(n) box-drawing graphic symbols:

n = Y U I O P @ M , . /]

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Figure 2. Epson MX-100 Graftrax Plus Control Codes.

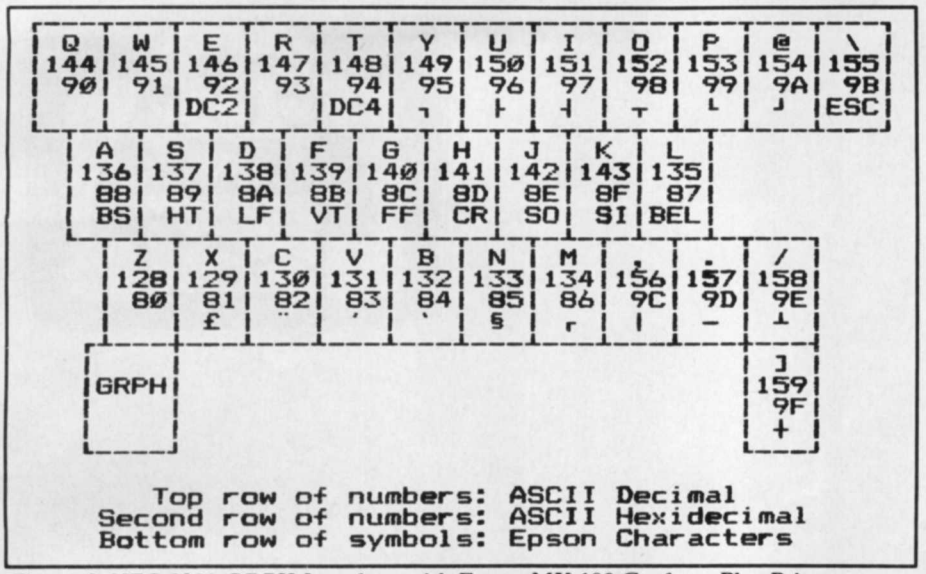


Figure 3. NEC 8201 GRPH Interface with Epson MX-100 Graftrax Plus Printer.

codes 128, 135-143, 146, and 148 are in the same class as 155, which we used for ESC. In general they duplicate the 0-31 ASCII control code subset at those codes plus 128 (ASCII 27 + ESC + ASCII 27 + 128 = 155). These codes have special uses in the Epson scheme of things as indicated in Figure 3.

Starting the Document

As a wrap-up let's take a look at how all these goodies are used with a LIST or PRINT to format the output and control the printer. I must indicate first, however, that I certainly don't see these procedures as substituting completely for a full featured word processor.

The procedure, using control codes, is as follows. The text is typed using ESC and GRPH codes as necessary. When it comes time to print, there must be some codes up front such as ESC-E for emphasized print. Also up front is ESC-9 to enable the paper-out sensor of the printer. That control will be used several times, but the first time is to eliminate the filename of this text.

On the NEC, LIST prints a filename no matter what I do, so I let it print on a piece of scrap paper or a 3 x 5 card. With no paper loaded into the printer and ESC-9 as the first after-filename output to the printer the filename prints, and the printer waits for paper to be loaded. I will be printing on cut sheets of paper, but I want to print closer to the bottom of the paper than the sensor will allow. Early on I even gave some thought to relocating the sensor, but it is easier to disable it again with ESC-8 at the beginning of a page and then insert ESC-9 at the spot I want to force a page-break. Most of the things I print this way are only a couple pages long.

This page-break paper-out sensor business can be avoided if continuous or fan-fold paper is used in conjunction with a Form Feed to force the page breaks at selected places or to allow the skip-over-perforation feature to do it for you. The latter will not provide for footers and headers as I will describe shortly.

First the matter of margins: My printer allows me to position any type of paper enough to the left of the left-most print head position to provide all the left margin I could want. The right margin is then controlled by the column width selected when LIST is invoked.

Line spacing is another consideration. My solution was to do some minor surgery on the printer. I now have windows and access holes in the top of my Epson case that allow me to reset the DIP switches at will. For continuous double-spacing, I just turn on SW2-3 for an additional linefeed with carriage return.

A couple more notes to NEC owners before we go: NEC has also neglected to let us in on the secret that GRPH-SHIFT-key will input ASCII 160-191 in the same key order as with GRPH. Above that, it is CHR$ all the way. You may find that these will be useful with your printer, or you may want to use them for screen graphics. If you have the capability of defining printer characters, you can have a ball with all of this.

Note also that you may have an Epson manual control code table with incorrect decimal codes for ESC codes Q through W and incorrect hexadecimal numbers for the high end controls VT through SI.

If you figure out how to make more of these codes do more things, let us know so we can pass them along in this column.

END

Coming Soon In creative computing

June

In-depth reviews of the Corvus Concept, Epson QX-10 (with the new, updated Valdocs operating system), the exciting Memotech computer, and a new notebook computer from Sord with integrated software.

Also, a special 16-page section on spreadsheets—what to look for when selecting one, characteristics of 21 full-featured packages, and descriptions of more than 50 templates and add-ons.

July

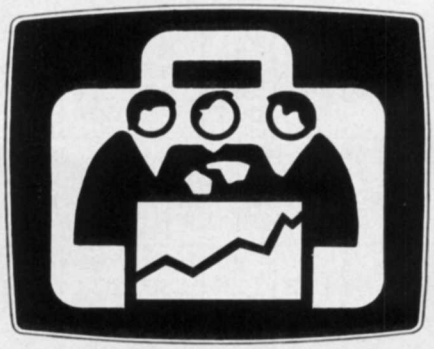
Graphics, graphics, graphics. Business graphics, artistic graphics, fun graphics. Regular features too, including an in-depth review of the NCR Decision Mate V.

August

Focus on the Japanese computer industry, selected companies, and the massive Fifth Generation Project to produce a supercomputer which uses artificial intelligence.

November

Gala 10th Anniversary issue. Articles by all the notable pioneers including Bill Gates, Scott Adams, Dan Bricklin, Clive Sinclair, John Kemeny, Carl Helmers, Gordon Bell, Harry Garland, Michael Shrayer, Ben Rosen, Ed Zaron, Dave Gordon, Paul Terrell, George Morrow, David Lien, and many, many more.



Let's Talk Business

Dale Blanchard

At the end of last month's column I said I intended to start this month with the question of whether to computerize at all. Then I wanted to explore the concept of the computer as a tool. In a wild burst of optimism, I thought I might get as far as looking at some word processing programs.

Should You Computerize?

Let's start with the question of whether to computerize at all. That is not a trivial question. Look around you; everyone is doing it. You ask yourself, "If I don't integrate computers into my business, how will I compete?" Let's think about your business for a minute. You provide either a product or a service. You charge for whatever you provide.

As you look at your competition, what can you do to make more money? Let's assume you manufacture a product. You have three choices:

- Raise your prices.
- Sell more of the same product for the same price.
- Reduce your operating costs so there is more profit per unit of product delivered.

If you have competition, you probably have ruled out number one. That leaves you considering the last two. How can a computer help you sell more of the same product for the same price? That is a question you will have to answer for your specific business, but here are a couple of ideas:

Selling Or Producing More

You might use a computer to make your sales force more efficient at following up new leads or at following up with your existing customers on a better schedule. The computer could tell you how much of your product a particular customer uses in a given period of time. This, of course, requires a program designed to do that.

One which comes to mind is *Leads* by Datamotion Associates, 795 Pine St. #42, San Francisco, CA 94108. This program provides you with a good way of listing your customers, gives you a diary of when to get back to them, and allows you to make notes about your last contact, which might include how much of your product the customer bought. There are other similar programs which your local computer store may be able to show you.

Ask yourself, "If I don't integrate computers into my business, how will I compete?"

In some operations the computer might actually allow you to produce more of the same product by streamlining your operation. You might analyze your work flow to see where things slow down, thus limiting production. Ranches and stock feeding operations have shown the ability to increase beef and other meat production by using computers to determine the most efficient feeding schedule and food combinations.

Lowering Production Costs

Back in the olden days, which I often refer to as my previous life, I introduced word processing into my business. Those of you who read last month's column know I did it because I was a lousy typist and that was the only way we could provide professional-looking reports to our customers. A happy by-product of the word processor was efficiency. When we got big enough that we could afford a secretary, we soon realized that we had only one. Most of our competition, companies of about the same size, had two, sometimes as many as four, secretaries.

Secretaries are expensive. Let's say you pay yours $1200 per month. When you add matching social security taxes, vacations, and other benefits the cost of that secretary is more like $1560 per month. That's $18,720 per year. You can get a good word processing setup for around $4000. If adding a $4000 computer-printer combination means you can avoid hiring another secretary, you save over $14,000 the first year. You can use that $14,000 to lower the cost of your product, thus allowing you to capture a larger percentage of the market, or you can simply pocket the profits.

Small manufacturing companies sometimes lower their production costs by using their computers to get control of their inventory. By analyzing their actual needs they are able to buy only what they need and are often able to anticipate their needs in such a way as to be

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able to take advantage of price specials from their suppliers. Either way, they pay less, thus increasing their profit margins.

Accounting is another area in which companies can save large amounts of money if they use computers intelligently. When I wrote the forerunner to Mini-Ledger, the bookkeeping system we use in our business, I found that we were spending about $1200 per year in accounting costs. One night I was sitting with the owners of two similar companies of about the same size. I found that one was spending about $3000 per year, and the other was spending about $4500. We were able to spend much less because we gave our accountant organized records from which he was able to prepare our taxes and other reports in a very short time.

If adding a $4000 computer-printer combination means you can avoid hiring another secretary, you save over $14,000 the first year.

Computers Are Not For Everyone

Recently one of my friends asked me if she needed a computer. She is a vocational counselor who has people referred to her by insurance companies. She runs a small office with one not-quite-full-time secretary. We talked for a few minutes about her operation and found that a computer could probably increase her efficiency in the following areas:

Word processing. She writes reports to insurance companies and many letters to a variety of people. Her reports tend to follow the same format, so it would be efficient to have these formats stored on the computer. Her letters are also similar enough that she could use a standard format. Currently, she dictates her reports and letters, and her secretary types them on an electric typewriter. With word processing, she would still dictate, but parts of the letters and reports, such as headings, could be used over and over, thus saving typing time.

Billing. My friend bills hourly for her time, and once a month or every time she sends a report, she also sends a bill to the insurance company. It would be nice to have the computer figure the bills, keep track of her receivables, calculate how much income she has each month, etc. Now, her secretary makes up the bills on the typewriter, does the calculations on a hand-held calculator, and enters the amounts in a ledger. When checks are received, they are checked off in the ledger.

Accounting. She thought it would be nice to have the computer keep track of her expenses in an orderly way, so that at the end of the year she could get her taxes done more cheaply. She presently uses a SafeGuard One-Write system and gives her books to the accountant at the end of the year.

Database management. Part of my friend's business is to help people find jobs. It would be nice to keep some kind of database of the places where she has found jobs in the past. This would make it easier to go back to these same employers to see if they have any current openings. Currently, her secretary keeps a card file.

Then we started talking about her not-quite-full-time secretary. This secretary has been with her for almost four years and is happy working about three-quarters time. I estimated that if my friend were to get a computer, she would eventually be able to get by with a half-time secretary. "But I couldn't keep her at half time," my friend said. "Doris couldn't afford a pay cut, and besides, I doubt if she would be happy working any less."

That meant my friend would have to:

- Get a new secretary, which she didn't want to do.
- Go out and increase her business by enough to keep her secretary busy. She didn't want to do that either.
- Bring in another counselor to work with her, again so the secretary would have enough to do. She likes working alone and really doesn't want a partner, or another employee.

We both concluded that she was probably better off without a computer. Her business was pretty much as she wanted it to be. She had time to spend with her family; her secretary was happy the way things were; and there was really no good business reason to buy a computer. There were several good reasons not to.

An Interesting Mistake

In last month's column I said that when I got into computers I eventually made enough mistakes that people began to think of me as an expert. Let me tell you about one of my more interesting ones. At that stage of my life I had four counseling offices in four different cities. I was in the main office and the other three were much smaller. One, however, was big enough that we needed a full-time secretary.

In that office we had a Lanier word processing system which we used for word processing, billing, and part of our accounting needs. The Lanier was a beautiful word processor, adequate billing machine, and a not at all adequate accounting machine. Because of the Lanier's inadequacies in these last two areas, Carol, the secretary, was having to really hustle to get everything done.

I had written a billing program and an accounting program which we were using in our main office. We couldn't use them in that office because they wouldn't run on the Lanier. We finally decided to sell the Lanier and put in an Eagle computer. We would lose just a little efficiency in word processing, but would gain immensely in billing and accounting.

We finally found a buyer for the Lanier and a couple of weeks later we were up to full speed on the Eagle. Billing for the month on the Lanier had always taken at least three days—sometimes as many as five—during which almost nothing else got done. With the new system, billing for the month was reduced to one day. Accounting with the program I had written took about three-quarters of the time it had on the Lanier. And suddenly Carol was doing needlepoint.

A Computer In Your Business

So what does all this mean for you? First off, I think the efficiency of most businesses can be improved by the intelligent addition of a computer. What you have to decide is whether that increased efficiency will allow you to produce more profit from your business.

The efficiency of most businesses can be improved by the intelligent addition of a computer.

Next Month

There is one more story I want to tell about how the addition of a computer could damage the profitability of a business, but I think I'll save it for next month. Since I didn't get to talking about the concept of the computer as a tool, I'll try to work that in. Also, I want to talk about some traps to be avoided when you add word processing to your office, and again, if I have the space, I'll try to look at some word processing programs.

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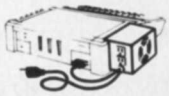

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Apple Cart

Steve Arrants

Welcome to another Cart. There are a few significant dates this month. DEC announced the Rainbow back in 1982, and Xerox released the Star microcomputer system in 1981. (Many of today's newest computers, such as the Lisa and Macintosh, use concepts pioneered by the Star.) And Apple introduced the Apple III on May 19, 1980.

This month we'll take a look at software for the Macintosh and answer some questions.

Macintosh Software

When Apple released Lisa, people were impressed with the technology. Technology itself doesn't sell machines, however. There was so little software available, and Apple was so slow to release technical information that most software authors concentrated on other machines—notably the IBM PC. It looks as if Apple has learned from that experience. A solid software base is rapidly building. You would expect to find the usual business software, but *games* for the Macintosh? Well, even an executive has to relax. Below are descriptions of just some of the software for Macintosh.

Personal Tax Planner

Aardvark/McGraw-Hill has released *Personal Tax Planner*, a federal income tax planning program for the Macintosh. It features a menu-driven, easy to understand format that enables users to examine up to five alternatives for a single tax year or projections for up to five successive years. *Personal Tax Planner* calculates tax liability, capital losses and gains, and taxable social security benefits. In addition, it automatically performs income averaging and alternative minimum tax calculations.

The program runs inside Macintosh windows, enabling the user to take advantage of the Macintosh icons and graphics. The Macintosh Cut/Paste utility may be used to take information from the program and merge it into a *MacWrite* file. *Personal Tax Planner* sells for $99.

CRTplus

CRTplus is a decision support tool designed to help financial institutions cope with the new competitive environment caused by deregulation. About half of all U.S. banks use microcomputers to some extent, but fewer than one in ten use them to explain and sell their products. With *CRTplus*, a bank can deliver information in a clearer manner to customers.

NPL is a database system that develops complete data management applications without conventional programming.

CRTplus performs a variety of financial calculations including IRA and Keogh analysis, loan alternatives and amortization, and taxable vs. nontaxable investment strategies. Using Macintosh graphics and windows, a customer can quickly see what difference a percentage point can make on a long term loan. *CRTplus* will be available for the Lisa and Macintosh in the second quarter of 1984 from Aurora Systems, Inc.

NPL Information Management System

DeskTop Software of Princeton, NJ, has adapted its *NPL Information Management System* for use on the Macintosh. *NPL* is a database system that develops complete data management applications without conventional programming. The user simply tells the Macintosh what he wants, and Macintosh figures out how to do it. *NPL* has a large vocabulary, so the programs look like English.

A typical *NPL* program might look like this:

PRINT NAME AND SALARY BY DEPARTMENT,
IF SALARY EXCEEDS 15000 AND IF DEGREE IS BA.

The resulting printout would include all data meeting the criteria set forth in the program.

Because the sentences can include phrases for sorting, computation, totaling, etc., the *NPL* system is suitable for a wide variety of file management areas such as personnel records, customer information, payroll, inventory, receivables, invoices, mailing labels, and form letters. Data entry formats can be user generated. Automatic validation is available for testing values, ranges, and data types. Information can be cut and pasted to *MacWrite* files.

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CIRCLE 123 ON READER SERVICE CARD

Soon to be available will be *The Sales Edge*, *The Management Edge*, and *The Negotiation Edge*. These interactive programs ask the user for information about himself and his situation and then provide a strategy that describes how he can best achieve his goals.

The Sales Edge offers the user information on how he can best present, conduct, and close a sale. *The Management Edge* gives the user advice on how to increase productivity and motivation, resolve conflicts and effectively discipline or reward an employee. *The Negotiation Edge* helps the user develop strategies for conducting negotiations in situations from buying a car to reaching a union agreement.

All three packages combine advanced theory on human interaction with sophisticated software design. They will be available in the second and third quarters of 1984.

Lotus 1-2-3

Lotus 1-2-3, one of the most popular integrated software packages, is now available for the Macintosh.

Lotus 1-2-3 combines spreadsheet analysis, graphing, and information management functions in one fast, powerful, and easy to use program. The program includes a built-in language capability that lets users custom tailor applications and store them to run with *Lotus 1-2-3*. The Macintosh version is designed to take advantage of the unique features of the Macintosh such as icons and the cut/paste utility, which permits data interchange among programs.

"We are making a major corporate commitment to Macintosh, which is natural, intuitive, and in line with how people think and work," Lotus president Mitch Kapor said. "This is going to change the way people think about personal computers. Macintosh sets a whole new standard, and we want our products to take advantage of this."

Lotus 1-2-3 for the Macintosh will be released this summer, following its introduction at the Spring '84 Comdex.

Microsoft

Microsoft has released a full line of application software for Macintosh and is actively working with Apple to develop software that uses Macintosh capabilities fully.

Multiplan, an advanced spreadsheet program, provides all the features of other versions of *Multiplan* plus additional enhancements. An UNDO command allows the reversal of the last change to the spreadsheet. Recalculation is faster on the Macintosh, and it will pause so the user experiences no delay while working. Enhancements to printing reports include headers and footers, and automatic page numbering.

"Macintosh sets a whole new standard, and we want our products to take advantage of this."

Word uses the graphics capabilities of the Macintosh to show visual representation of text and graphics on the screen, including proportional spacing and support for all Macintosh fonts.

Chart is a powerful business graphics program that enables graphics data to be entered, edited, and formatted directly in windows on the screen. *Chart* presents the user with a gallery of different charts—bar, line, pie, and scatter—that he can choose to visualize the chosen data.

File is a productivity tool for the storage and retrieval of data and offers form-based data entry and retrieval. File formats which are user-modifiable are selected from a system library.

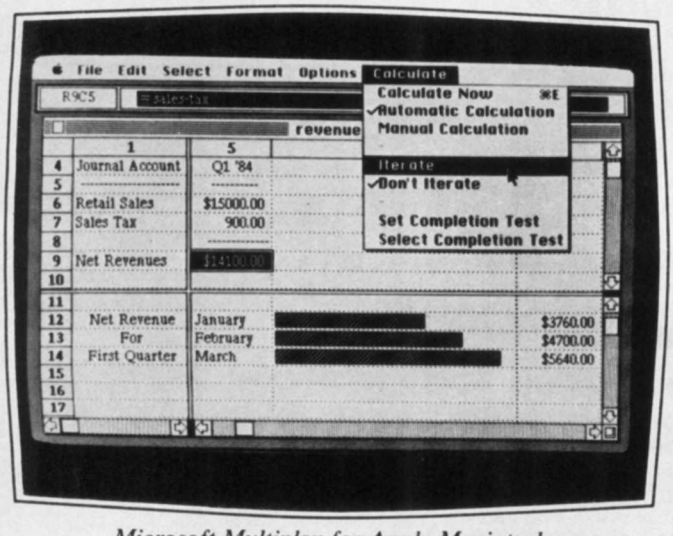
All Microsoft products incorporate the features of the Macintosh interface such as pull-down menus and the mouse. The user can cut and paste between Microsoft and Apple programs.

Microsoft Basic takes full advantage of the large direct addressing capability of the Macintosh Motorola 68000 microprocessor, including a decimal math pack with 14-digit precision and string variables and expressions of up to 32,767 characters each. It is source code compatible with all standard versions of Microsoft Basic, allowing easy integration of programs written in that language.

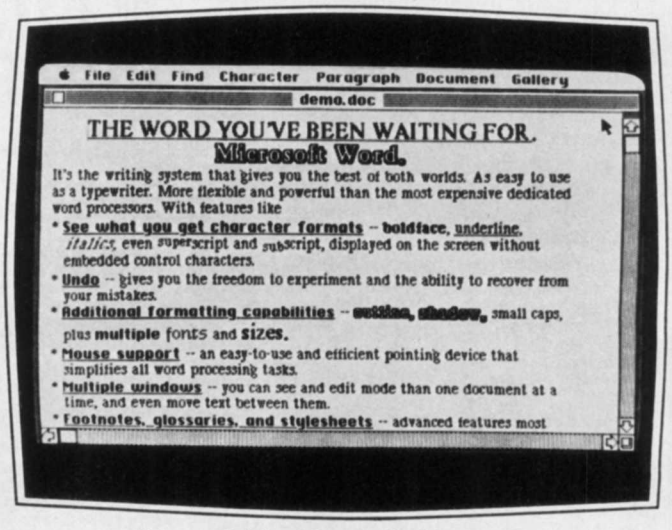
Microsoft Basic incorporates the Macintosh interface and presents the user with up to three kinds of windows—one for command entry when in the direct mode or for editing a listing, one for viewing the program listing, and one for the output of the running program. It includes many of the extended graphics capabilities of Microsoft's GW Basic, as well as support for the Macintosh Font manager and call access to the Macintosh Quickdraw routines.

Bill Gates, president of Microsoft, expects big sales of the Macintosh and associated software. Says Gates, "We believe that as much as one-half of our 1984 and 1985 application program revenues could come from sales of Microsoft's Macintosh programs."

Multiplan, *Word*, and *File* for the Macintosh are priced at $195 each. *Chart* is priced at $125, and Microsoft Basic is available for $150.



Microsoft Multiplan for Apple Macintosh.



Microsoft Word for Apple Macintosh.

PFS Software

Software Publishing Corporation is bringing the popular PFS family of software out on the Macintosh.

PFS:File is an information management program with comprehensive filing, sorting, and searching capabilities. All types of information can be stored in user-designed forms that may resemble familiar paper forms such as invoices or personnel records.

PFS:Report increases the usefulness of information stored with *PFS:File* by summarizing and performing calculations on the information. The user can then print presentation-quality tabular reports or display them on the screen for review and decision making.

Macintosh Peripherals

Mac Disk and Mac Link

Davong Systems Inc. manufactures hard disk storage systems ranging from 5 to 32Mb for the Macintosh. Mac Disk systems will be especially useful in handling accounting, database, and other large data applications. A 28Mb tape back-up system is in development. All Mac Disk products are shipped with necessary cabling and adapters, software utilities, and documentation.

Mac Link is a local area networking system that will allow up to 255 Macintosh computers to share hard disk storage, communicate with each other, and share other resources such as plotters and printers. Mac Link incorporates much of the hardware and software technology Davong developed for MultiLink, Davong's local area network for IBM PCs and XTs.

Macintosh Games

Infocom Releases

The full line of Infocom interactive adventure games is available for the Macintosh. The *Zork* trilogy, *Enchanter, Sorcerer, Planetfall, Suspended, Starcross, Witness, Deadline,* and *Infidel* are interactive games involving science fiction, mystery, fantasy, and adventure. With each new release, Infocom sets a new standard for text games. Each game is a realistic excursion into another world. The packaging with each game includes maps, clues, and other objects to get you into the spirit of the adventure.

Blue Chip Simulations

For those who enjoy the worlds of high finance and cut throat competition, Blue Chip Software has three games that should satisfy your appetite.

Millionaire is a stock market simulation game that compresses 77 weeks of trading into a two-hour exercise. You begin with $10,000 and make purchases based on a steady stream of business and news information. As your net worth increases, you enter more complex levels of trading and investment alternatives.

Tycoon is similar, except that the high pressure commodity market is your arena. At the start of the game, the computer creates a market involving 15 different commodities. You start out in week two with access to the preceding year's data. Each game compresses 52 weeks into one hour.

Real estate is the subject of *Baron.* This simulation explores the various investment opportunities, risks, and rewards in today's real estate market.

These are not just games. Each involves learning the complex rules of business and investment finance. Excellent educational vehicles, they are appropriate for use in the high school and university classroom.

Mac Link is a local area networking system that will allow up to 255 Macintosh computers to share hard disk storage, communicate with each other, and share other resources such as plotters and printers.

The Future

From the product information covering my desk, it looks as though software developers feel comfortable with the Macintosh. Some of the products are adaptations of IBM PC business software which will utilize the special abilities of the Macintosh. A great amount of software for the Apple II is being re-written for Macintosh. Of course, since they use different microprocessors (6502 and 68000), different Basics, and totally different designs, these conversions may take some time. Unlike the conversion from DOS 3.2 to DOS 3.3, there is no MacMuffin program available.

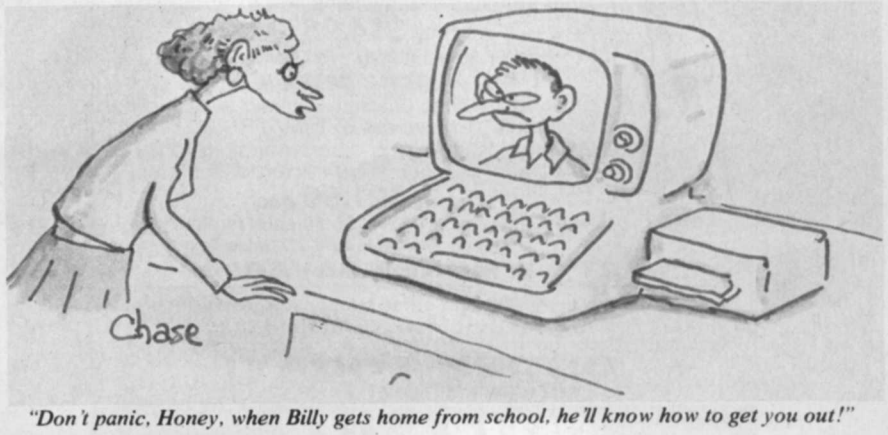
Questions and Answers

Because of space limitations, your responses about DOS errors will be included next month. We do have room for two short questions, however.

Jean Brydon of Center City, PA, writes: "I have an Apple II with Integer Basic on the motherboard and an Applesoft ROM card. I had the autostart ROM installed, and that's when the problems started. After a few hours of use, my Apple decides to call it a day. Rebooting doesn't help. What can I do? Is it my Apple, the new ROM, or something else?"

I can sympathize with you, Jean. There is nothing worse than a computer in coma. Unfortunately, I don't have any easy answers. What happens when you remove the autostart ROM and replace it with your old set-up? If the same problem occurs, it is probably a failure somewhere else in your motherboard and not in the new ROM. How clean is your motherboard? I suggest removing the chips (gently!) and cleaning both the pins and the contacts with a soft, clean pencil eraser. Perhaps some chips have come unseated from the heat. Try pressing each one back into its socket. If you still have problems, have an Apple technician investigate.

From Michael Abels in Moscow, ID: "I brought an Apple from Europe to the U.S. Before shipping, I removed all the chips from the motherboard since I was told that the X-ray equipment in Customs might spoil them. When I replaced the chips, I put two in backwards. I have put them back in correctly now, but my Apple still acts funny. What did I do wrong?



"Don't panic, Honey, when Billy gets home from school, he'll know how to get you out!"

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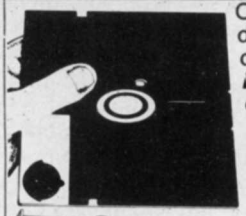

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CIRCLE 217 ON READER SERVICE CARD

Apple Cart, continued...

Will two new chips make the Apple work normally?"

First, are all the pins correctly inserted? It is easy to bend a pin underneath the chip. Examine all the chips for this. Remember, when inserting chips, the notch on the chip should face in the same direction as the notch on the chip seat. Two new chips *might* help. I would have a technician look at it. Are you sure it is the chips that are at fault and not your power supply? A European Apple won't run in the U.S. without an adapter or the properly rated power supply.

That wraps it up for May. Next month we'll compare two printer cards for the Apple II that aid in printing graphic pages. We'll also look at an undocumented Pascal procedure for PEEKing and POKEing, and examine some uncommon DOS errors. END

Firms Mentioned in This Column

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Aurora Systems, Inc.
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Madison, WI 53704
(608) 249-5875

Blue Chip Software, Inc.
19824 Ventura Blvd.
Suite 204
Woodland Hills, CA 91364
(213) 881-8288

Davong Systems, Inc.
217 Humboldt Ct.
Sunnyvale, CA 94086
(408) 734-4900

DeskTop Software Corporation
228 Alexander St.
Princeton, NJ 08540
(609) 924-7111

Infocom, Inc.
55 Wheeler St.
Cambridge, MA 02138
(617) 492-1031

Lotus Development Corporation
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Cambridge, MA 02142
(617) 492-7171

Microsoft Corporation
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Planetfall	49.95	AP, AT, COM, PC
Prisoner 2	32.95	AP, AT
Quest	19.95	AP
SAGA Series	39.95	AP, AT
Starcross	39.95	AP, AT, COM, PC
Suspended	49.95	AP, AT, COM, PC
Atlantis	39.95	AP
Witness	49.95	AP, AT, COM, PC
Zork I, II, III	39.95	AP, AT, COM, PC
Ultima I	34.95	AP, AT
Ultima II	59.95	AP, AT
Ultima III	59.95	AP, AT, COM, PC
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Wizardry: Knights of Diamonds	34.95	AP
Wizardry: Legacy of Llylgamyn	39.95	AP
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Choplifter	34.95	AP, AT, COM
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Frogger	34.95	AP, AT, COM, PC
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Alphabet Zoo	29.95	AP, AT, COM, PC
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Highrise	30.00	AP
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Stickybear Numbers	39.95	AP
Stickybear Bop	39.95	AP
Stickybear Shapes	39.95	AP
Stickybear Opposites	39.95	AP
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Tic Tac Show	39.95	AP, PC
Type Attack	39.95	AP, AT, COM, PC
Typing Tutor II	24.95	AP
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☐	Lotus I, II, III	~~$495.00~~	$325.00
☐	d-Base II	~~$700.00~~	$370.00
		Sub-total	$
		NY State residents add sales tax	$
		Add $2.50 ea. purchase for shipping & handling	$
		PROGRAMS TOTAL	$

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		NY State residents add sales tax on purchase prices only	$
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1 Year Charter Membership	**$10.00**
Add $5 fee for each program you send us for exchange	$
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Programs of the Month Total (Box 3)	$
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IMPORTANT!

Please be certain that the titles of the software you send us or request from us appear on the *Current Software Exchange List.* All prices listed are subject to change without notice.
Also be sure that the value of the software you *send* us equals the value of the programs you *request.*
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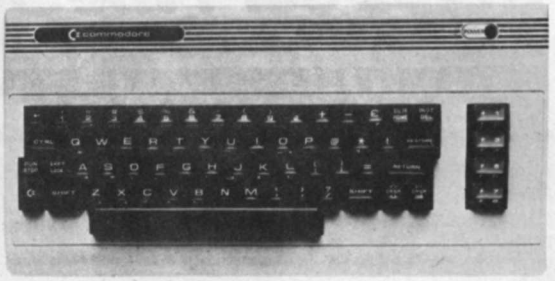
CIRCLE 149 ON READER SERVICE CARD



Commodore's Port

John J. Anderson

Be patient. Despite solid evidence to the contrary, spring is indeed on its way, and shall be with us shortly. Yes sir: buds, greenness, and the sweet smell of thaw. Sunshine with warmth attached to it. Enthusiastic tweety birds. Focus on this image, and it will make the back you strained shoveling snow yesterday feel better.

The 264 is Shelved

The late-breaking rumor, now confirmed by two reliable sources, has it that the Commodore 264 line has been shelved at least until December. My guess is that Commodore rightly perceived the 264 as too competitive with its best-selling brother, the 64 itself. So don't hold your breath.

If the rumor is true, it at least shows some flexibility on Commodore's part. Unmaking the decision to introduce the 264 took a bit of courage, and the weathering of a short-term credibility problem. In the longer run, it will be a smart decision.

Plugging In Some Loose Ends

At first I thought about calling this section "Resetting Some Bones of Contention," but that would not have been quite accurate. Let's just say that there have been a few "loose ends" generated by Commodore coverage in previous editions of *Creative Computing*. And it's a good idea to tie up loose ends—if you leave them hanging, they can occasionally whip you in the face.

First is an extremely important point, and one that has caused me an amazing amount of abuse. It was reported to me in October of 1983, and I reported to you in January, 1984, that the *Commodore Disk Bonus Pack* was a promotional package offered as a freebie by Commodore dealers. Well this loose end caught me right between the eyes.

Bonus Pack Boondoggle

Scout's honor: at one time, the package *was* free. Might have been only an hour or so, though. And no more. It is not free anymore. Repeat: *Disk Bonus Pack* no longer free.

According to Commodore Customer Support, the *Bonus Pack* was a promotion released to dealers, with distribution of said packages left to dealer discretion. They constituted a limited promotion, and as such, *Bonus Packs* are no longer being distributed free of charge, from Commodore or anyplace else. If you want to buy one, you will have to see your local dealer—you *cannot* order it from Commodore. Repeat: *cannot* order *Bonus Pack* from Commodore.

Frankly, I was a little bit shocked to learn that owners of early 1541 disk drives were *not* automatically being supplied with free copies of the disk *Wedge*. These were not one or two isolated cases, either—I have received over a dozen calls in the past two weeks—and that doesn't count letters. A good many disk owners are without the *Wedge*, as they purchased drives before a finalized program was appended to the test/demo disk packed in the box. Lack of the program makes working with the 1541 a bit less than a lark. Repeat: *Wedge* lack no lark.

Upon reflection, I realized my own naiveté. Customer service wants to rub me out, and for good reason. I caused a stampede of early disk owners on their 800 lines, each demanding a free disk. What a jerk, huh? My apologies.

Why should Commodore supply early owners of drives with a copy of the *Wedge?* Do they owe them something special just because they were at one time Commodore's most loyal customers, running out to buy drives way back in the summer of '83? Of course not. Pretty silly of me.

The rest of the programs in the *Bonus Pack* amount to very little compared to the utility of the *Wedge* program. But *no*, kids. Stop beating up on poor old Commodore. If you have a drive but do not have the *Wedge*, that's really too bad. Try to buy it from your local dealer, and best of luck.

George Lightfoot, of East Leroy, MI, was especially offended by the form letter response to the *Bonus Pack* query, which, alongside a note that basically said "go fish," included a subscription form to *Power/Play* and *Commodore* magazines. Slightly tacky, if you ask me.

Enough of that already. One extremely positive step came as a result of the hue and cry, and that was the motivation for an improved *Creative Computing* MiniDos for the C-64. It is offered up ahead for those of you without the *Wedge*. There isn't much point to fighting the 1541 disk drive every inch of the way, and if you can't get a hold of the *Wedge*, MiniDos Menu is the next best thing.

In fact, even if you have the *Wedge*, you should probably have our new Menu program, too. It has been streamlined, and given an improved user inter-

Commodore 64 Magic Desk I

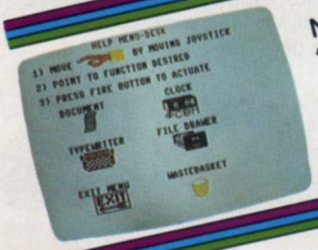
Only From Commodore—The Excitement and Simplicity of Magic Desk!

Only Commodore brings you the magic of MAGIC DESK...the next generation of "user friendly" software! Imagine using your computer to type, file and edit personal letters and papers *without learning any special commands!* All MAGIC DESK commands are PICTURES. Just move the animated hand to the picture of the feature you want to use (like the TYPEWRITER) and you're ready to go.

The MAGIC DESK Typewriter works just like a real ELECTRIC TYPEWRITER ...and it's COMPUTERIZED. All the filing is *electronic*. Excellent sound effects and screen animation make typing fun, whether you're typing letters, reports or memos...and the built-in filing feature makes MAGIC DESK useful for keeping names and addresses, home inventory lists, insurance information and more.

Your COMMODORE 64, COMMODORE DISK DRIVE and MAGIC DESK are an unbeatable combination. Filing operations are automatically linked to your Commodore disk drive—but you don't have to know any commands—just "file" the pages you type in the file cabinet and your text is automatically saved on diskette. There are 3 file drawers with 10 file folders in each drawer and 10 pages in each folder.

To PRINT a page you've typed, just "point" at the picture of the printer and your pages are automatically printed on your COMMODORE PRINTER or PRINTER/PLOTTER. If you want to erase what you've typed, the WASTE-BASKET under the desk lets you "throw away" pages. There's even a DIGITAL CLOCK which helps you keep track of time while you're typing.



Not only is MAGIC DESK easy to use...it's hard to make a mistake! Just press the COMMODORE key and one of several "help menus" appears to tell you exactly what to do next. Special messages show you how the various picture commands work and help you when you make a mistake. Help messages also show you how to use the printer, filing cabinet, digital clock and wastebasket.

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CIRCLE 115 ON READER SERVICE CARD

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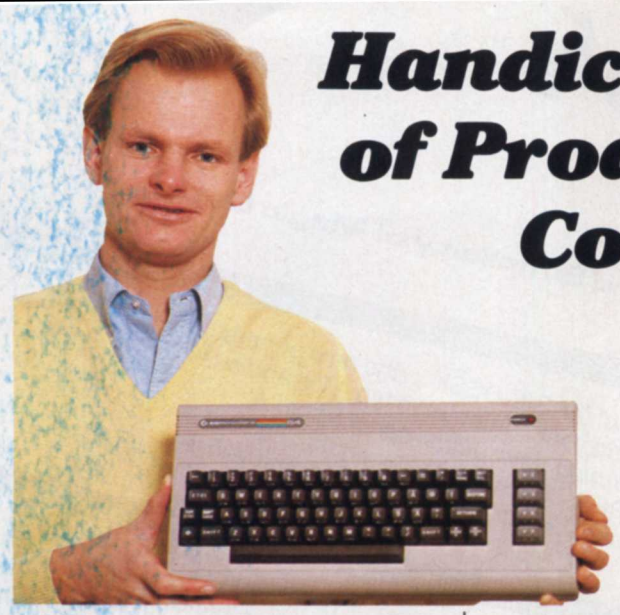
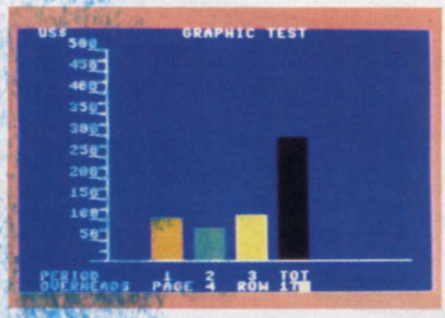


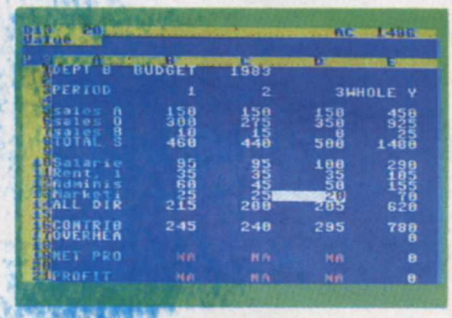
Handle your home budget, stock portfolio, loans and mortgages with Calc Result

Calc Result Easy is a simple-to-use spreadsheet program for the Commodore 64. It includes 254 lines × 64 columns, built-in graphics, and flexible printout formats. Plug-in cartridge... just plug it in and its ready. Perfect for cash flow analysis, personal net worth, IRA analysis, travel expenses, credit card expenditures, gas and electricity bills, etc.



Calc Result Easy $49.95

Calc Result Advanced gives you 32 pages of interrelated information. The three-dimensional feature allows you to consolidate calculations in summary format. Calc Result Advanced comes on plug-in cartridge and disk. Disk drive required.



Calc Result Advanced $99.95

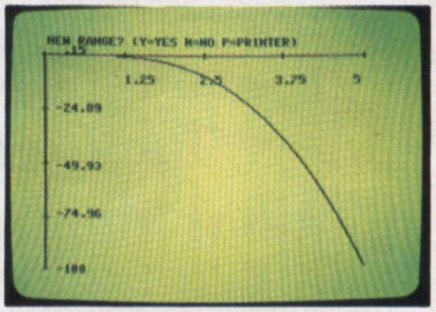
A complete database for the home

Addresses, telephone numbers, appointments, birthdays, or records–whatever you want to remember–put it on DIARY, an electronic notebook for home use. DIARY comes on a plug-in cartridge. It's easy to use and easy to learn, giving you the flexibility to design a personal calendar or address book.

Diary $29.95

Turn statistical information into graphic format

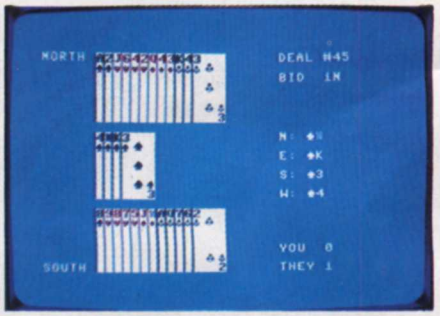
GRAF 64 converts mathematical functions into graphical analysis on the Commodore 64. An ideal program for studying math. Define a function, set the limits of an axis, plot a graph and display the extreme points, intersection values, etc.



Graf 64 $29.95

Develop your bridge skills

Whether you're an experienced bridge player or a beginner, polish your skills or learn the game with BRIDGE 64. Play North-South, then switch to East-West in the same deal, the return to that deal again and test your skill with a different strategy.



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CIRCLE 159 ON READER SERVICE CARD

face. It now offers a directory upon program run, as well as a program RUN option from the menu itself. If there is one C-64 program you type from this magazine, this should be it.

But before we move to the program itself, we have a few other topics to cover, including three more loose ends.

The Kornreich is Green

In the February issue of *Creative Computing*, we took Commodore to task for age discrimination in a press release rebutting a *Wall Street Journal* article. We quoted the release, which quoted the article, which quoted a Mr. Joel Kornreich-president of CSI Distributors and Computer Strategies. Now we have heard from a fairly agitated Mr. Kornreich himself, and in fairness, have granted him a bit of space to state his version of the case. To say he feels maligned by Commodore is to put it mildly. And in quoting the Commodore press release, we inadvertently reported Commodore's side of Mr. Kornreich's story. Now, in the interests of equal time and fairness to a third-party company mentioned in the article and release, here is the world according to Kornreich:

* * *

We are extremely disappointed in your coverage in your February, 1984 issue of the pending lawsuits between Computer Strategies, Inc. and Commodore Business Machines, Inc. Your article repeats word for word a Commodore press release which substantially misstated the status of these legal actions. We have gone to great lengths to correct this misinformation within the financial community by distributing our own press release. Nonetheless, your article was apparently written without ever seeing our response nor obtaining any comment from us. You do no credit to your enjoyable magazine nor any service to your readers by only reporting one side of a story.

Irving Gould, chairman of the board of Commodore, neglected to mention in Commodore's statement that shortly before suit was brought against Strategies, our corporation brought suit against Commodore for damages in excess of $50,000,000 arising from, among other things, breach of contract, and wrongful termination of the business relationship between the corporations. Since that period we have also brought suit in Federal Court against Commodore for Antitrust, Robinson/Patman Violations.

Alan Friedman, who is presently employed by both Strategies and a related corporation, was in good standing at Commodore at the time of his resignation, and held the post of finacial vice-president. He resigned that position of his own accord. Mr. Gould's reference to a demotion of Mr. Friedman from that post to a lesser one is simply not based in fact.

We further wish to bring to your attention that Strategies' sales for the fiscal year 1982/83 *represented 1%* of Commodore Computer sales worldwide. In a little over 4½ years, Strategies has sold in excess of 10,800 computers. We believe that our experience and our sales volume qualifies us to comment on the current state of the computer market. We hope that our dispute with Commodore does not overshadow the fact that Strategies remains in the computer field as a dealer of computer products, and looks forward to continuing to do business with your readers.

Thank you for providing the opportunity to set the record straight.

* * *

Egg on my Interface

Okay. Two more loose ends and we're home free. This one was a typographical error. In December we reported an incorrect price for the Card/Print interface from Cardco. We received this response from the company:

* * *

In the article on page 327, of the December 1983 issue, you made reference to our card/print interfaces. You listed our price at $19.95. This is incorrect. Presently, we make three interfaces; the A, the B, and the +G. Our least expensive interface is the Card/Print B with a suggested retail price of $49.95.

* * *

Sorry if our low but incorrect price got your hopes up.

Give us a Handic

Finally. Greg Yob's otherwise fine review of *CalcResult* in the March issue listed the incorrect name and address of the manufacturer, through no fault of Greg's. *CalcResult* is a fully functional spreadsheet for the Commodore 64, and Yob gave it 4½ stars of a possible 5. The manufacturer of *CalcResult* is Handic, 5090 Central Highway, Suite 7, Pennsauken, NJ 08110. (609) 866-1001. Very sorry for any inconvenience the error might have caused.

Menu: a C-64 MiniDos

Now for the fun stuff. Listing 1 is version 2.2 of Menu, a Basic program that makes working with the 1541 disk drive much easier. Even if you typed in the original version of Menu from the April 1983 Commodore's Port, you may want to type in this improved program. It is easier to work with and offers some new options. At the same time, it is quite a bit shorter than the original program.

Figure 1 will help you locate all the special graphics characters you'll need to type in. Every line in which they appear is indicated in the figure.

The real utility of the Menu program is knowing that a copy of it resides on every data disk you own. When you power up, type LOAD "MENU", 8 then press RETURN. When the C-64 comes back with a READY, run the program.

Automatically upon the program RUN, a disk directory will be provided. First the name and extender of the current disk are listed. Then the lengths, names, and types of files are listed. After the directory is completed, a menu prompt of choices appears. You pick a letter, hit RETURN, and the chosen process is automatically carried out for you.

Here is the roster of functions Menu can perform:

• (←) RUN. By pressing the left-arrow key, which is the top-left key on the C-64 keyboard, you can autorun any program in the directory. Hit RETURN to confirm your selection. Then the computer will ask for the filename of the program you wish to run. Enter it. Then

Character Function Keypress Line(s)

Clear screen and home cursor	SHIFT — CLR	210
Blue	CTRL — BLU	210,225,230 262,282
Red	CTRL — RED	225,262
Green	CTRL — GRN	225,276
Turns inverse on	CTRL — 9	262,276
Turns inverse off	CTRL — 0	262

Figure 1.

press RETURN once more. The program you chose will load and run.

• (F)ORMAT. Formats a disk. Before you can store any information on a blank disk it must be formatted. Choose the format selection. The program will give you a chance to insert a blank disk. It will then ask you for a disk name. After you have entered a disk name, you will be prompted to enter an extender—a two-digit number. When you press RETURN again, the disk will format automatically. Remember that when you format a disk, you automatically erase anything that might be on it. Make sure the disk you want to format is in the drive at the time of formatting.

• (C)OPY. Allows you to copy a file under a new filename. Prompts you for a source and new filename. Then creates an identical file under new filename.

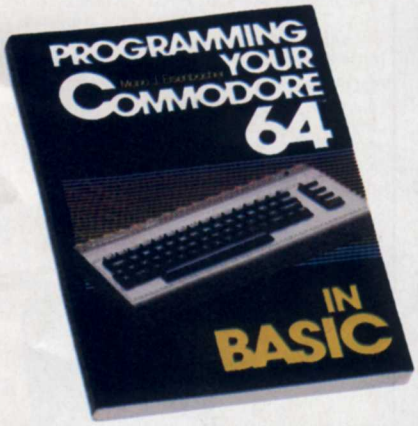
• (E)RASE. Deletes a file from disk. Prompts you for a filename. Then gives you one chance to reconsider and deletes the file.

• (D)IRECTORY. Lists the files on disk. Happens once automatically when

Listing 1.

```
1 REM C-64 DISK USER'S MENU
2 REM VERSION 2.2 -- FEB 84
3 REM BY JOHN J. ANDERSON
10 POKE 53280,1:POKE 53281,1
20 GOSUB 200
30 PRINT"--------------------------------
--------"
40 PRINT"(←) RUN, (F)ORMAT, (C)OPY, (E)R
ASE"
50 PRINT"(D)IRECTORY, (*) CHECK ERROR ST
ATUS"
60 PRINT"(R)ENAME, (W)RITE MENU, (Q)UIT
MENU"
70 PRINT"--------------------------------
--------"
80 INPUT X$
90 IF X$="D" THEN GOSUB 200
100 IF X$="F" THEN GOSUB 300
110 IF X$="C" THEN GOSUB 400
120 IF X$="E" THEN GOSUB 500
130 IF X$="W" THEN GOSUB 600
140 IF X$="Q" THEN GOSUB 350
150 IF X$="*" THEN GOSUB 650
160 IF X$="←" THEN GOSUB 550
170 IF X$="R" THEN GOSUB 450
180 GOTO 30
200 PRINT:PRINT
210 PRINT:PRINT:PRINT"■----------------
----------------------"
220 PRINT"MENU 1541 -- VERSION 2.2 -- C-
64 -- JJA"
223 PRINT"--------------------------------
---------"
225 PRINT"■LENGTH    ■NAME
 ■TYPE"
230 PRINT"■----------------------------
----------"
251 OPEN 1,8,0,"$"
252 GET #1,A$,B$
254 GET #1,A$,B$
256 GET #1,A$,B$
258 C=0:IF A$()""THEN C=ASC(A$)
260 IF B$()""THEN C=C+ASC(B$)*256
262 PRINT"■■"MID$(STR$(C),2);TAB(7);"■■
 ";
264 GET #1,B$:IF ST()0THEN 282
266 IF B$()CHR$(34)THEN 264
268 GET #1,B$:IF B$()CHR$(34) THEN PRINT
B$;:GOTO268
270 GET #1,B$:IF B$=CHR$(32) THEN 270
272 PRINTTAB(29);:C$=""
274 C$=C$+B$:GET #1,B$:IF B$()""THEN 274
276 PRINT"■■"LEFT$(C$,3)
280 IF ST=0 THEN 254
282 PRINT"BLOCKS FREE■"
284 CLOSE 1:RETURN
300 REM FORMAT DISK
305 PRINT"INSERT DISK TO BE FORMATTED.":
PRINT
310 PRINT"INPUT DISK NAME" :INPUT DISK$
320 PRINT "INPUT DISK NUMBER":INPUT EXT$
325 MACRO$="N:"+DISK$+","+EXT$
330 OPEN 15,8,15,MACRO$
340 CLOSE 15:MACRO$="":RETURN
350 REM EXIT PROGRAM
380 PRINT"EXIT TO BASIC.":NEW
400 REM COPY FILE
410 PRINT"INPUT SOURCE FILE NAME" :INPUT
 DISK$
420 PRINT "INPUT NEW FILE NAME":INPUT NW
S$
425 MACRO$="C:"+NWS$+"="+DISK$
430 OPEN 15,8,15,MACRO$
440 CLOSE 15:MACRO$="":RETURN
450 REM RENAME FILE
460 PRINT"INPUT OLD FILE NAME" :INPUT DI
SK$
470 PRINT "INPUT NEW FILE NAME":INPUT NW
S$
475 MACRO$="R:"+NWS$+"="+DISK$
480 OPEN 15,8,15,MACRO$
490 CLOSE 15:MACRO$="":RETURN
500 REM DELETE FILE
510 PRINT"INPUT FILE NAME TO DELETE":INP
UT DISK$
520 PRINT"HIT (RETURN) TO DELETE":INPUT
X$
530 MACRO$="S:"+DISK$
535 OPEN 15,8,15,MACRO$
540 CLOSE 15:MACRO$="":RETURN
550 PRINT"TYPE IN FILENAME TO RUN, HIT (
RETURN)"
570 INPUT N$:LOAD N$,8:RUN
600 REM SAVE MENU FILE
610 PRINT"INSERT DISK TO BE WRITTEN TO."
:PRINT
620 PRINT"HIT (RETURN) TO WRITE MENU FIL
E":INPUT X$
625 OPEN 1,8,15
630 SAVE "MENU",8
635 CLOSE 1
640 RETURN
650 OPEN 1,8,15
660 INPUT#1,A,B$,C,D
680 PRINT"ERROR STATUS":PRINT:PRINT"ERRO
R # ";A
685 PRINT B$:PRINT"TRACK ";C,"SECTOR ";D
690 CLOSE 1:RETURN
```

Prentice-Hall speaks a language other publishers have forgotten. English.*



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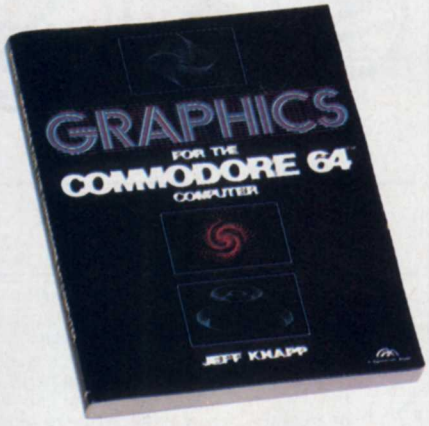

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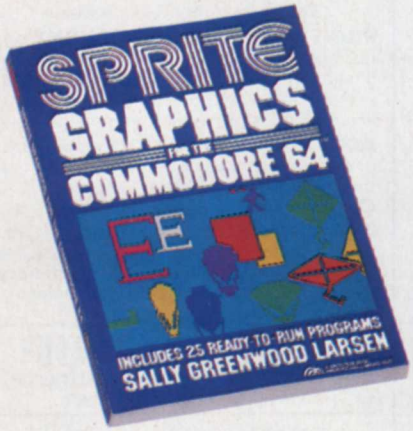
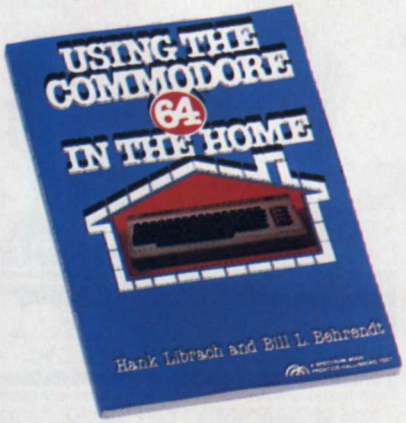


SPRITE GRAPHICS FOR THE COMMODORE 64 by Sally Greenwood Larsen. Shows how to produce high resolution, color, animated graphics. Twenty-five read-to-run sample programs. $15.95



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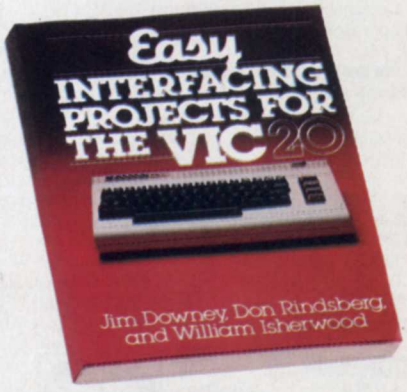

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CIRCLE 156 ON READER SERVICE CARD

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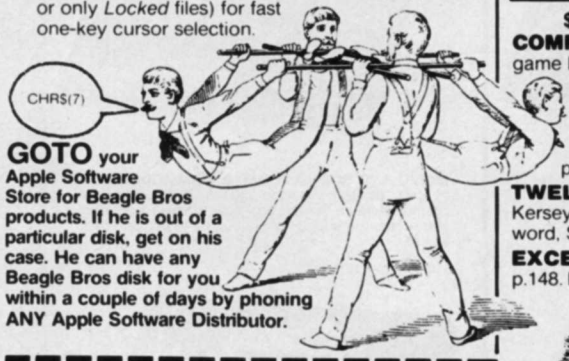

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AD#8A

DOS BOSS

DISK COMMAND EDITOR
by BERT KERSEY and JACK CASSIDY

$24.00: Includes Peeks/Pokes Chart & Tip Book #2.

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CUSTOMIZE DOS. Change the catalog Disk Volume heading to your message or title. Omit or alter catalog file codes. Fascinating documentation, tips and educational Apple experiments.

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```
10 LIST: LIST: LIST: FOR ZZ=PEEK(175)+PEEK
(176)*256+36 TO 3072: POKE ZZ,216: NEXT
20 FOR XXX=1 TO 2: POKE-16299,0: POKE
-16300,0: XXX=1: NEXT: REM Experiment
with different length variable names.
```

BEAGLE BAG

12 APPLE GAMES ON ONE DISK
by BERT KERSEY

$29.50: Includes Peeks & Pokes Chart

COMPARE BEAGLE BAG with any single-game Locked-Up disk on the market today. All 12 games are a blast, the price is a bargain, the instructions are crystal clear, *and* the disk is COPYABLE. You can even *change* the programs or list them to learn programming tricks by seeing how they work.

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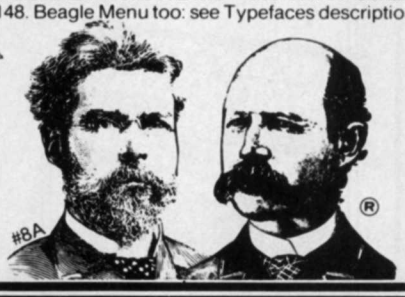
EXCELLENT REVIEWS—See Jan-83 *Softalk*, p.148. Beagle Menu too: see Typefaces description.



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ALL BEAGLE DISKS ARE UNLOCKED, COPYABLE AND COMPATIBLE WITH APPLE II, II+ AND IIe.* (Don't Settle for Less!)

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(FORMERLY "FLEX TEXT")
VARIABLE-WIDTH HI-RES TEXT UTILITY
by MARK SIMONSEN

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PRINT VARIABLE-WIDTH TEXT on both hi-res screens with normal Applesoft commands (including HTAB 1-70). Normal, expanded & compressed text with no extra hardware. (70-column text requires a monochrome monitor, not a tv).

ADD GRAPHICS TO TEXT or add Text to hi-res graphics. Run your existing Applesoft programs under Flex Type control. Fast, easy to use, and Compatible with GPLE and Double-Take.

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FAST APPLE DISPLAY UTILITY
by TOM WEISHAAR

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PROFESSIONAL PRESENTATIONS: Turn your existing Hi-Res, Lo-Res and Text frames into attractive Apple "slide shows". *FAST* hi-res loads in 2½-seconds! Paddle or Keyboard-advance frames.

UNATTENDED SHOWS are optional, with each picture arranged and pre-programmed to display on the screen from 1 to 99 seconds. Custom **Text Screen Editor** lets you create black-and-white text "slides" and add type "live" from the keyboard during shows. Mail copies of presentations on disk to your friends and associates (or home to Mom!).

program is run. It is a good idea to run a directory right after any file manipulation from Menu, to make sure the operation has come off successfully.

• (*) CHECK ERROR STATUS. Queries the error channel on the disk drive. If any Menu operation results in a blinking red light on the disk drive, it is time to choose this option. It will give you an error number with English translation, plus track and sector location of the error if applicable. Error 0 equals no error.

• (R)ENAME. Allows you to change the name of any file. Prompts you for an old and new filename. Then changes filename.

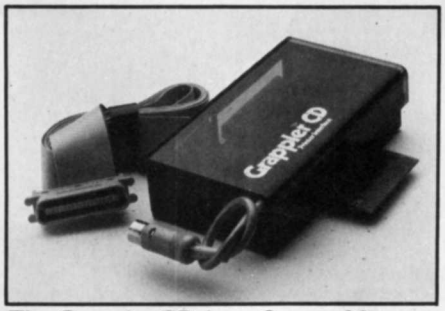
• (W)RITE MENU. Automatically puts a copy of the Menu program itself out to disk. After you format a disk, go right to this option and save the Menu to it. Then you can use the new disk to access the Menu program from that point forward. You can also put a copy of the Menu on all existing data disks with at least nine remaining sectors. The program takes up only 2.3K and can fit on even the most packed disks. Try to find space for it.

• (Q)UIT MENU. Eliminates the Menu program from memory and brings you back out to Basic.

Orange Grappler for the C-64

Space for only one product announcement this time around. Orange Micro, makers of the Grappler Interface for Apple computers, has announced the Grappler CD intelligent printer interface for the Commodore 64.

The Grappler CD contains a Commodore 1525 emulation mode, allowing Epson, Star, Oki, C. Itoh, NEC, and other graphics printers to produce special Commodore graphics characters. Alternatively, English tags can be used to label special graphic characters.



The Grappler CD from Orange Micro.

In addition, screen dump routines allow printing of hi-res graphics—in double-size, inverted, rotated, and emphasized. Special screen dumps for Epson FX/RX aspect ratios are also included. The Grappler CD also includes a host of text formatting features, with margin and page length settings, as well as linefeed control and skip-over-perf features.

Well then. That's it for now. And take my word for it. The next time you read this column the weather will be absolutely beautiful. But until then, dress warmly, okay? Catch you next time.

Firms Mentioned In This Column

Commodore Computers
1200 Wilson Dr.
West Chester, PA 19380
(215) 431-9100

Cardco Inc.
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Wichita, KS 67214
(316) 267-6525

Handic Software Inc.
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IBM Images

Susan Glinert-Cole

The question for this month is: can you get a competent word processing program for less than $100?

Inexpensive word processors can often provide the necessary functions for writing letters, doing short papers, and printing out nasty notes to the neighbors regarding the color of their house. Recommending less expensive word processors does not negate the value of a full-featured program like *WordPerfect*; it acknowledges the value of expedience. There are not that many word processors on the market for less than $100, but I did lay my hands on a few and took them for a test document or two.

PC-Write

PC-Write from Quicksoft is an example of freeware. You are invited to copy the disk and distribute it to your friends. The disk, with an excellent manual, is available for $10. If you wish, you can register your disk for $75. This entitles you to several extras: a printed, bound copy of the documentation, telephone support, Pascal and assembly language source code, a copy of the next update, and a $25 commission every time someone registers a copy of your disk. This is an amazing bargain in these days of multi-hundred dollar software, especially considering the high quality of the package.

The documentation is complete and well-written. My version has a typeset copy neatly held in a nicely illustrated plastic binder, but a manual is on the disk and can be printed out with a provided program. The editor program, with ancillary files, occupies about 28,000 bytes. *PC-Write* can be run on a fully-loaded PCjr.

PC-Write keeps the current document in memory at all times. A 64K system limits you to about six double-spaced pages. With 128K or more, the limit rises to about 30 double-spaced pages. To give you an idea of how much text that is, a typical "IBM Images" column generally runs about 16 pages double-spaced. This may be a severe limitation to writers of long documents, but long text can be broken up into chapters or sections.

The text entry screen is pleasantly free of clutter. A prompt line keeps track of editing space remaining, the justification mode (on or off), the file name, and the percentage of text before this point in the entire file, which gives you a rough idea of where you are in the document. Cursor movement is flexible: Home and End go to the beginning and end of the current line respectively; the arrow keys go up, down, right, and left; and PgUp and PgDn scroll the document up and down a line. You can also scroll up and down by paragraphs. Ins inserts spaces; the Scroll Lock key toggles between insert and overwrite mode. *PC-Write* will also move right and left by word, up and down by paragraph, to the top and bottom of the screen, and to the beginning and end of the document.

The text entry screen is pleasantly free of clutter.

It also has extensive deletion facilities. You can delete by character, word left, word right, and to the end of the line. The key assignments are well thought out, but the documentation suffers from a poor choice of graphic descriptions. The up-arrow symbol is used to signify the Ctrl key, and an asterisk is used for the Shift key. This can be incredibly confusing. Text is not automatically reformatted; you must request this function when you want it.

There are several extra touches in *PC-Write* that make it something special. Pressing the (unshifted) * key will shift the next key pressed; the 5 key on the numeric keypad will produce the same effect for the Ctrl key. This is for people who don't want, or are unable to press two keys at once.

The cursor is used in imaginative ways to indicate the mode you are in. Normally a thin, blinking line, it expands to a block when a Shift key is pressed and to a larger block when Ctrl is pressed. All of the toggle keys, Caps Lock, Scroll Lock, and Num Lock, are signaled by a different cursor. *PC-Write* can transpose two characters either forward or backward, a facility I wish *WordPerfect* had. Word and line deletions can be recalled with an "undo" key.

Other pleasantries include a centering key, a case change facility, and provision for changing screen colors if you have a color monitor. The color selection is very flexible: colors can be designated for nine different attributes including the color of marked text, marking text, help

screens, ruler line, and so on.

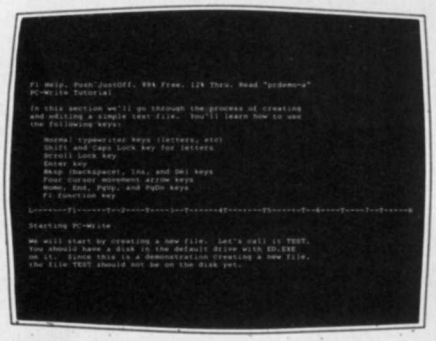
The search and replace facility is easy to use; text can be searched forward and backward. The found string is highlighted, which is a great deal more revealing than a thin, blinking cursor. Wild cards are accepted in a search string, and by entering special search characters with function keys, the search can be made case insensitive. End of the line characters are also accepted in search and replace. This is the only way to alter the spacing of a document on the display.

Text marking is very well implemented in *PC-Write*. First, the selected text is highlighted, and then the cursor changes to indicate that you are in the "marking" mode. Text can be marked as words or lines; if you make a mistake, moving the cursor backward will unmark it. When you have finished marking, the block can be moved, copied, or deleted at will.

Moving sections of text around is very easy. The copy function works fine, and block deletes can be recalled if you goof. The marked text can be copied to a file. *PC-Write* can also bring a file into the current text. This is done in the marking mode, so you can see exactly what range you have inserted.

Margins and tabs are changed with a "ruler line." Pressing F2 calls it to the screen. The ruler can be edited like text, but only four characters are accepted: R for right margin, L for left margin, T for tab, and P for paragraph margin. The ruler line is also used to divide the screen into two windows. You can edit in either window, but you can't move text from one to the other.

Text formatting is done either on-screen (what-you-see-is-what-you-get mode) or with a set of dot commands.



PC-Write.

Printer commands, for font changes and so on, can be placed in the text. *PC-Write* can generate headers and footers, extra margins, multiple line spacing, page numbers, and extra vertical lines at the top.

Program execution is very fast. I didn't find any bugs in it, but I only used it for a couple of hours. If you are looking for an inexpensive, reasonably sophisticated word processor, *PC-Write* is worth going out of your way for.

Bank Street Writer

As a professional writer, I have some serious reservations about *Bank Street Writer* from Broderbund Software. First and worst, there appears to be no way to reform text after you have diddled with it. Second, when you exit the program, it does not correctly restore the cursor environment if you have selected a (non-blinking) block for a cursor.

Another thing that irritated me was that text in bold and underlined modes is delimited by gigantic reverse video blocks that say BOLD and UNDERLINED. Also, every time you elect to indent or change the margin, another giant reverse video billboard appears to let you know that the text is indented or the margin is changed, even though you can see it perfectly well on the display. If you do a lot of bolding, underlining, or indenting, the screen is a mass of screaming reverse video messages.

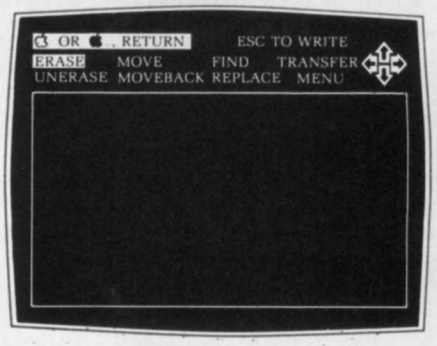
Almost every time you want to do something, like move text around, it asks you a tedious number of questions, and then asks you if you're sure you want to do it. I found this, as I said, tedious. Also, many commands are selected from a menu, which is splendid. However, you have to use the tab key to move to the desired selection and this becomes irritating after a while.

Bank Street Writer is crashproof and very easy to learn.

Document size is limited to about 6000 words. When you ask *BSW* how much space is left, it tells you in words, but it doesn't tell you how big a word is. Similarly, the documentation is mum about system requirements, except to say that, under DOS 2.0, it will allow you to edit only very small files. And finally, the program is copy protected, although they do supply one backup disk in the package and will send you another one free if you make a mess of both provided copies.

On the positive side, *Bank Street Writer* is crashproof and very easy to learn. I think it more suitable to children learning their way around word processing than it is to adults. It has move, move back, copy, search and replace, erase and unerase, move to the beginning/end of line and top/bottom of document. Text entry is always done in the insert mode; there is no overstrike mode in *BSW*.

The print facilities are pretty complete. *BSW* will let you do headers and footers, change the page position num-



Bank Street Writer.

bers, insert printer commands in the text and set right, left, top, and bottom margins. Line spacing can be single, double, or triple, and you can opt to print either multiple copies of a file, or only part of a file. Tabs can be set; lines can be centered; and files can be deleted or renamed from within the program. *BSW* is menu driven, but you can also assign function keys to commands.

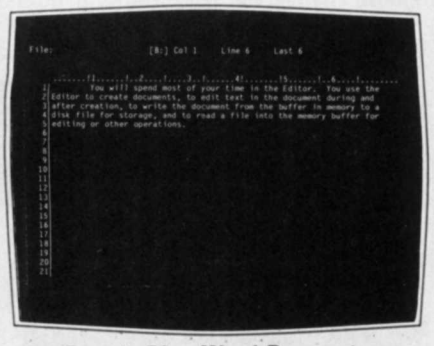
I found this word processor immensely tiresome, but I think kids and beginners will enjoy its simplicity and ease of use, although the documentation is not very good. It consists of a 55-page pamphlet that exhibits one of my particular pet peeves: it won't lie flat on the desk. There is an on-disk tutorial, and you are instructed to invoke it by pressing T when the program is loading. I tried that, and it didn't work. No phone number is to be found anywhere in the manual. *BSW* will run on PCjr. and retails for $79.95.

Bonnie Blue Word Processor

Another deal of the decade is the *Bonnie Blue Word Processor* from Bonnie Blue Software. It retails for $50 and does everything but sign your name. I have to admit that the copy I have is a final "beta test," and the documentation is a draft. I experienced no problems with it, but several features were not yet implemented. The manual is very complete (more than 100 8½ x 11 pages) and clearly written, but suffers from a lack of an index and an adequate table of contents. *Bonnie Blue* is a very powerful program with many neat features; without a good map of the manual, you can waste a lot of time trying to find what you're looking for.

The default text entry screen is

reminiscent of spreadsheets: both the rows down and the columns across are numbered. The screen format can be changed to several other layouts if you don't like the default. *Bonnie* uses the function keys, combined with Alt, Ctrl, and Shift, for most of the commands.



Bonnie Blue Word Processor.

Less frequently used facilities like disk and file commands, remapping keys, and doing word counts are entered on a command line. The top line is reserved for toggle key information, and the second line for command entry. This makes the display a bit cluttered if the row and columns are on-screen, especially when a function key invokes a secondary menu (this, too, is placed on the second line, and things get hard to read).

To give you an idea how flexible *Bonnie* is, the summary of commands and keystrokes runs nine pages. Along with the usual cursor movement of right/left by character and word, beginning/end of line and document, and page up/down, the scroll lock key is used to scroll text up and down. If you press Alt and S, the cursor will scroll all by itself to the bottom of the text or until you toggle it off. Similarly, Alt and T will scroll the cursor to the top. Both the speed and direction can be controlled from the keyboard during the scroll. If the Scroll Lock key has been toggled on, these two commands scroll the text, instead of the cursor.

Bonnie Blue has a whole set of "attribute paint" keys. With them, you can underline, bold, reverse video, or change the colors (if you have a color monitor). The attributes can be painted on by character, word, or line and can, of course, be set so that all text entry carries the current attributes. There is also a set of keys for "unpainting."

Other keys center lines; do on-screen justification; delete by word, line, or block; move, copy, and save a block as a file; undelete by word, line, or block; set/clear tab at current column; and reformat text. There is also an automatic indent facility for block-structured language programmers (or for offsetting text) and a left/right margin control.

If you can't remember the keystrokes, there are on-line help menus that pop onto the screen with a press of a function key. And, if you don't like their help screens, you can write your own. The keyboard can be entirely reconfigured (with the exception of state keys like Shift) and there is a fast and nifty word count command which can begin and end the count wherever you like.

If you can't remember the keystrokes, there are on-line help menus that pop onto the screen with a press of a function key.

The summary of print facilities, implemented as dot commands, take up an entire page, and the printer options take up another page and a half. The usual top/bottom/right/left margins are there, as well as super- and subscripts, line skipping, headers and footers, include/chain file, centering, and wait.

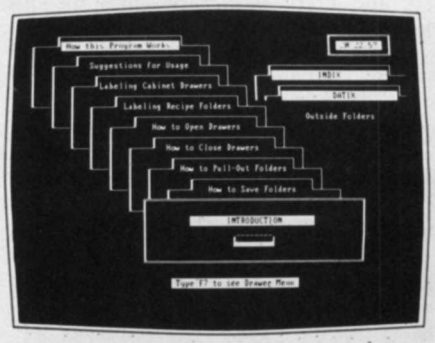
I am very impressed with this word processor. There are very few features to wish for (footnotes and automatic reformatting are two), and the price, for the value, is really amazing. The program isn't small—about 118,000 bytes—and the minimum memory configuration I guess to be starting at 192K (the manual doesn't say). Unfortunately, with all that overhead you can only edit a document of about 32K. With a document of maximum size, however, the program is still lightning fast. When text exceeds the size of the edit buffer, an amusing message appears. The files can be saved as ASCII, and almost everything can be switched around if you don't like the way Ron Greenberg, the author, assigned defaults.

Offix

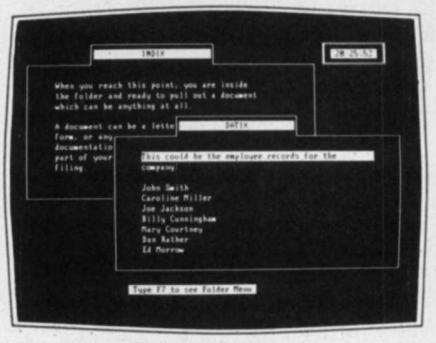
Emerging Technology, the company that makes the wonderful editor *Edix*, has come out with an "integrated" $99 package called *Offix*. Basically, it combines form design with a database query facility, a report generator, and a word processor. The package consists of a disk, housed in a plastic folder. There is no documentation. I shook the package a few times hoping something would fall out, and then decided that maybe they were taking lessons from SurlySoft. In fact, the documentation is entirely integrated into the program; a printed manual is unnecessary. The program is semi-copy protected. The original is needed for booting the program; it can then be removed and a data disk substituted. Additional disks are available for $20. The program can be installed in the colors of your choice.

When you type OFFIX, a couple of file drawers appear on the display, and you are told how to get help. After that, you have the option of running a tutorial, getting help for the initial menu, or going to work. The system is entirely menu driven, but the menus must be invoked with a function key. This is convenient for the advanced *Offix*er, who knows what's what and wants to get right down to business. No matter where you are, you can request help for the various facilities. At the inital menu level of each category, you can get a tutorial on the subject.

The program has a friendly tone, and is very iconic. First you must point to a file drawer and open it (by pressing O). Then you must select a folder which you take out of the drawer and open. *Then* you can do several things: design an empty form for the folder; fill in some forms; search filled-in forms for names, numbers, or numeric ranges; erase forms; and generate reports. When you have finished, you can replace the folder



Offix drawer level.



Offix folder level.

or leave it out for another time. If you want to replace the folder, you must first close it and then put it back. Finally, you close the file drawer. The process is reminiscent of adventure games at their finest. "You are in the cabinet room. What do you want to do? Open the drawer. OK. Look in the drawer . . ."

While *Offix* does have a word processor, it is quite limited. Search and replace, block move and copy, and a few delete options (by line and block only) are there, but text marking can only be done by entire lines; you can't mark partial lines. Page layout is done by filling in fields on a picture of a page. You can adjust the left, right, and bottom margins; the number of lines per page; and the line spacing (single, double, or triple). You can supply a page heading and turn page numbering on and off. As a word processor alone, I think you would be better off with another product. However, the *Offix* word processor is not designed for writing books. Rather, it is means for designing forms to be used with the database query facility. In this context, the product is quite nice.

Each folder can have one form with up to 50 fields, although the form cannot exceed 22 lines or 80 columns. Once the form has been created, you fill it in with the relevant information. A folder full of forms can then be searched for specific entries. In addition, you can write a stock form letter with the word processor, using field names in curly braces where you want information filled in from the database. *Offix* will generate the letters and print them to the screen, the printer, or a file.

Offix can also generate reports, which consist of data taken from filled-in forms printed in columns. Generating a report involves filling out a form for search criteria, for column titles, for width, and for report layout.

The program is reasonably fast, although it does do a fair amount of disk writing when filing forms and searching for things inside the folder. The human interface is really fine; if you press an incorrect key, a message (in plain English) tells you what the problem is and offers help.

All of this menu/help/tutorial exacts a price: the program is enormous and requires at least 192K and two 360K disk drives to run. If you are looking for a program that can do some light database/form letter and report generation, *Offix* is definitely worth the price. Be aware, however, that it is not for doing manuscripts of even six double-spaced pages if your requirements are the least bit unusual. Not being able to move parts of lines really cripples the flexibility of the program.

I haven't actually seen *FriendlyWriter* with *FriendlySpeller* from FriendlySoft, but the advertisement looks enticing. For $69.95, you get a word processor, suitable for letters of up to six pages, and a spelling checker. The package looks fairly powerful: user-defined layouts; single or double spacing; adjustable right, left, top, and bottom margins; on/off justification; move copy; insert and delete by character, word, or block.

Offix can also generate reports, which consist of data taken from filled-in forms printed in columns.

Reformatting is claimed to be automatic, and it will produce on-screen underlining with "most monitors." I think this means that it will do actual underlining on the IBM monochrome display, and signal underlined text by a color/intensity change on other monitors capable of supporting this type of variation. *FriendlyWriter* supports more than 35 printers with automatic initialization. It looks like a good deal for light word processing.

So which one of the numerous, less expensive word processors would I recommend? *Xywrite*, as I have said, is excellent. *PC-Write* is the buy of the century. It isn't quite as flexible as *Xywrite*, but the price of $00.00 makes up for a great deal. *Bonnie Blue* is more powerful than *PC-Write*, and can also be used to excellent effect by programmers regardless of language preference. The $50 price tag is fair for the extra features available.

Offix is a nice, inexpensive alternative to complicated, pricey and user-surly database managers. *Bank Street Writer* is probably more appropriate for children or adults who use a word processor infrequently. It does not want to let you make a mistake.

The conclusion? You *can* get a competent word processor for less than $100. Which one you choose depends, as always, on your specific requirements. END

Firms Mentioned In This Column

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Bonnie Blue Software
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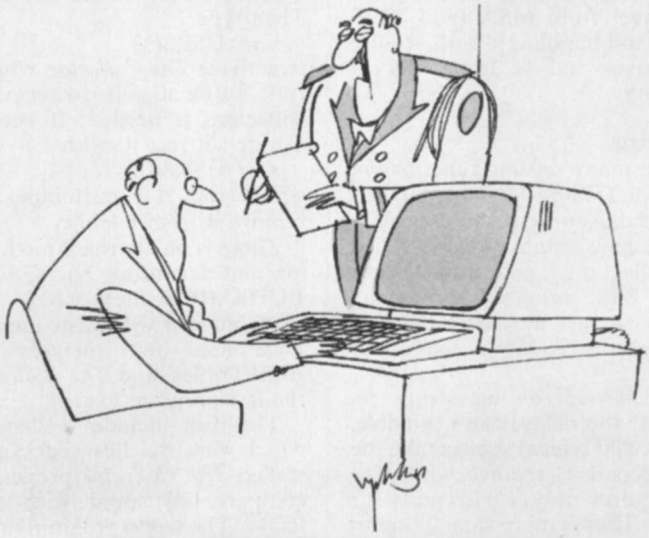
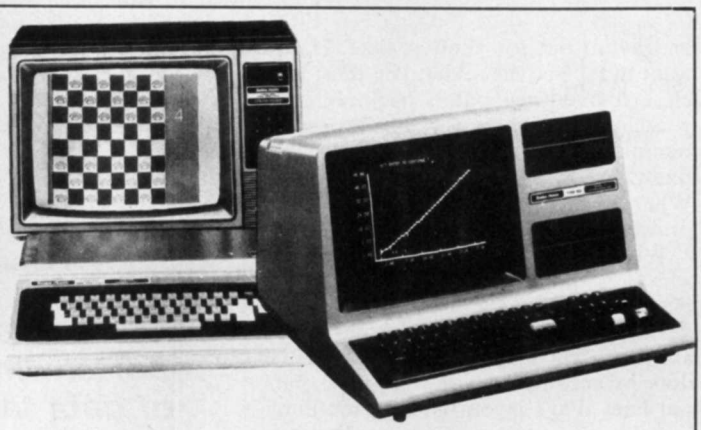
Liverpool, NY 13088
(315) 652-1304



"Would you like to see a menu?"



TRS-80 Strings

Stephen B. Gray

At 63 fathoms below the surface of the Tandy Sea, we dimly spot a garbage collector, a Basic analyzer, and three graphics programs.

Modular Software Associates

One of the companies that specializes in utilities is MSA, Modular Software Associates, which writes programs of interest to bit-hackers who understand the value of the company's somewhat exotic utilities.

Not everybody will need or want *The Collector* or *The Analyst*, but for those who know the value of high-speed garbage collection and of analyzing variables to speed up Basic programs, they are well worth their $24.95 price ($26.45 each in California) at your computer dealer or direct from MSA (add $2.50 for shipping and handling). Both require two disk drives and at least 32K of RAM memory.

The Collector

One of the many unsung functions of the ROM in a TRS-80 Model I/III/4 is to remove strings no longer in use, making room for new strings. This is called "garbage collection," and if you have ever used a Basic program with many strings, you can get a weird keyboard lockup when the ROM is collecting garbage.

The Collector speeds up string removal so that the delays are negligible. For example, 500 typical strings take the ROM 46.3 seconds to remove, while *The Collector* requires only 1.6 seconds for the same job. That is more than 28 times faster than the ROM. The more strings to eliminate, the higher the ratio between ROM and *Collector* operations in collecting garbage: removing 2000 strings typically requires the ROM 713.3 seconds; *The Collector* is said to do the job in 7.8 seconds.

Using *The Collector* is fairly simple. Copy the COLLECT/CMD file to your system disk so it will always be available for use. Then later, whenever you need it, first load *The Collector* from DOS, enter Basic, activate *The Collector*, and use your Basic program(s).

After you load *The Collector*, it displays a DEFUSR address. When you enter Basic, don't set high memory, but type in the DEFUSR address supplied. Then type

```
x = USR8(1)
```

to activate *The Collector*, which will now run automatically whenever garbage collection is needed. If necessary, you can de-activate it, with

```
x = USR8(0)
```

which stops it from running, but doesn't remove it from memory.

There is an alternate method for loading and activating *The Collector*, using BUILD/JCL files, which is fast and easy, but you will waste memory if your DOS uses high memory to execute BUILD files, and *The Collector* must be the last program loaded.

The disk includes a demo program, which first verifies that you have installed *The Collector* properly and then compares its speed with that of the ROM. The demo program initializes 500 strings, removes them with *The Collector* in a couple of seconds, then uses the ROM garbage collector for the same job, which takes about 45 seconds.

The ten-page manual explains just about everything quite thoroughly, with step-by-step procedures, and without assuming you know all about the subject at hand. However, you probably won't want *The Collector* unless you do know quite a bit about collecting garbage.

The Collector uses only 498 bytes for itself, plus two bytes for each active string. It relocates in high memory and protects itself from being overwritten by Basic. It can be used with machine language programs, too, including *The Analyst* and MSA's *NewBasic*, which adds more than 40 commands to disk Basic, including sound and more than a dozen graphics commands of the type found in the Color Computer; *NewBasic* will be reviewed here later.

The Analyst

Another MSA utility analyzes your Basic program during its execution and tells you how many times each variable is referenced. Once you know this, you can easily add a few simple DIM statements to sequence the variables in order of frequency. In most cases, MSA says, this will speed up the execution of commercial software, as well as your own, from 15 to 50%.

The Analyst can also tell you which line numbers in your program are executed the most. You can then look at these lines and try to make them more efficient.

To load and activate *The Analyst*, follow the same procedure as for *The Collector*, but use USR9(1) instead. Then run your Basic program, display results of *The Analyst*, and modify your program.

The Analyst provides a menu, with eight choices:

0) De-activate *The Analyst* and return to Basic.
1) Initialize: Clear data and stop collecting.
2) Stop collecting.
3) Collect variables only.
4) Collect line numbers only.
5) Collect variables and line numbers.
6) Display results.
7) Display CLEAR, DEF, and DIM, line numbers.
8) Return to Basic.

The Analyst can collect data on up to 400 variables and/or line numbers. You can collect the two separately for a capacity of 400 variables and 400 line numbers.

After you choose a data-collection option from the menu, you run your program. Then you select an option for displaying the results, sorted by frequency, or alphabetically/numerically, or unsorted (in order of occurrence). Next you are prompted for a display limit; hit ENTER and you display all variables and line numbers collected. Enter a number for the lower display limit, and only variables or line numbers that were counted at least that many times will be displayed.

The last option is to print or not, on a parallel printer only; *The Analyst* doesn't support serial printers.

The data are displayed by groups: simple (non-array) variables; array variables; and line numbers.

Modifying Your Program

The DIM statement you can now add to your program should consist of the variables in the same order as displayed by *The Analyst* when sorted by-frequency.

The Analyst has other uses besides giving frequency data on variables. Used for debugging, it can find mistyped variables by looking at an alphabetically-sorted variable list. *The Analyst* can also be loaded and activated via BUILD/JCL.

The disk includes a demo program, which performs five shell sorts of 50 random letters of the alphabet. Call up the main menu, select option 3, enter 8 to return to Basic, run the demo program, and then display the results with menu option 6.

The 22-page *Analyst* manual is a model of clarity and thoroughness; the writing is just about the best I have seen in a manual.

Computerware

Computerware advertises "One Stop Shopping for Color Computer Products." This California company offers products from many sources as well as both hardware and software generated in-house.

Among the software packages written by Computerware are three graphics programs: *Semi Draw*, *Foxygraf*, and *3D Drawing Board*, all for the Color Computer. *Semi Draw* is reviewed in depth in the December 1983 issue of *Creative Computing*.

Foxygraf

For the user who insists on a more sophisticated graphics package, Computerware offers *Foxygraf*, listed in their four-page catalog as *Foxy Graf* and as a "complete hi-res graphics development package with extensive documentation—comprehensive tutorial and assembly programming tool." *Foxygraf* (named after the author's pet terrier) is for a 16K Color Computer; $24.95 on cassette, $34.95 on disk.

Load *Foxgraf*, and the first two screens are the main menu with 24 items. The program uses audio tones in a very helpful way: whenever *Foxygraf* is ready for a command, it gives a low-pitched beep; when it receives a valid command letter, it gives a medium-pitched beep. Hit the wrong key, and you don't get a tone.

Hit Q and you get the Query page, which shows the various parameters you can set from the Initialize screen, such as the page number you want to start drawing on, background color, cursor color, cursor width (1, 2, 4, or 8 bits), mode number, etc.

Once you set these parameters, you can refer back to the Query page at any time to examine and/or change the parameters. The Query page shows exactly where your cursor is, by giving its address, as well as the row and column it is in. You also see numbers for the page width and height, which depend on the mode and color set.

Hit I for Initialize, and prompts will guide you through setting

PAGE ADDRESS (4 HEX):
MODE (1 DIGIT):
COLOR (5 BITS):
CURSOR COLOR (2 HEX):
BKGND COLOR (2 HEX):
DRAW (1,2,4,8):
CLEAR PAGE (Y/N)

and as you respond with the correct numbers, you get a high-pitched beep; when you have given all the numbers required for each, the next prompt appears automatically, so this all goes quite fast once you get the hang of it.

If you use Y to CLEAR PAGE, you are suddenly on a graphics page with a little orange cursor in the top left corner of a field of white (Radio Shack calls it buff). If you make a mistake in any of this or the following, hit BREAK, touch I, and start over.

Use the arrow keys to move the cursor around the screen. If you want it to move faster, hit W and number between 00 (very fast) and 80 (very slow). To set a point, hold the spacebar down. If you have made a line you want to erase, just go over it with the cursor without holding down the spacebar.

You can change the width of the cursor at any time by hitting D and then 1, 2, 4, or 8. The height stays the same, but the width varies from about an eighth to a quarter of an inch, depending on which D number you use.

Anytime you want to change the cursor color, touch the NCH (New Cursor Hex) keys and two hex digits. Not only are cursors available in solid colors, but in two-, three-, and four-tone models, depending on your choice of hex-digit pairs and the D number. To change the color of the trail left by the cursor, follow the same procedure but touch NBH (New Background Hex). That means the cursor can be one color, and leave a trail of a completely different color, which can be a help when you are trying to keep track of where the cursor is on the screen.

Choosing a D number determines the mode and thus the width of the cursor, which determines how many pixels per byte there are. In mode 8, there are four pixels per byte. Each pair of pixels produces a different color:

00 - white
01 - green
10 - blue
11 - orange

So if you choose a mode 8 cursor, you can make it all one color or striped with two, three, or four different colors. Choose a mode 4, 2, or 1 cursor, and you get a progressively narrower one and thus fewer choices of a multiple-color cursor.

There is no need to use the cursor to fill a large area with one color. Just hit F (for Fill), give two memory addresses (2000 and 23FF, for example), and a color (such as 55), and the top half of the screen instantly turns green. Move the cursor, and it leaves a green trail; this is done automatically by the Fill command. Most of the time it is a convenience; the rest of the time, be careful.

Fill the bottom half of the screen (2400-27FF) with blue (AA). Touch F and ENTER without specifying locations, and the whole screen becomes blue; that is the default action for the Fill command.

To draw a line between two points (if you don't have Extended Color Basic), place the cursor at the first point and hit /. Then place it at the second point, hit /

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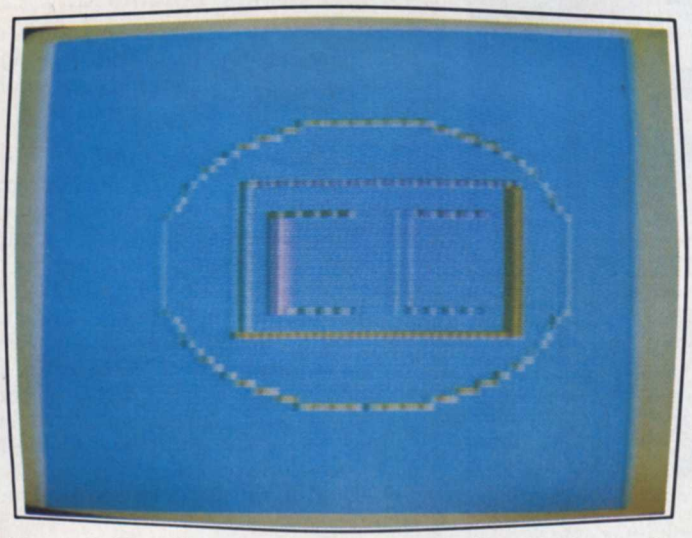


Figure 1. The ellipse was drawn automatically with Foxygraf. The rest is made up of striped lines drawn with a mode-8 multiple-color cursor.

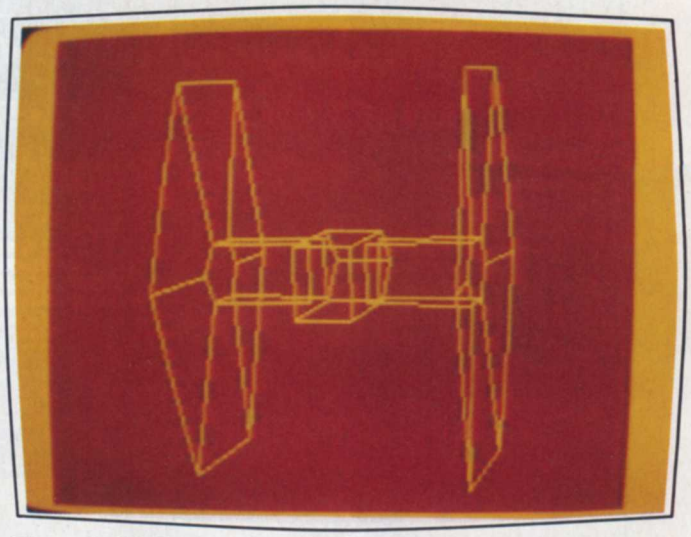


Figure 2. 3D Drawing Board offers this Star Wars tie-fighter as a demo; you can turn it in any direction, and change its size.

again, and the line is instantly drawn.

To draw an ellipse, put the cursor at the center of your ellipse-to-be and hit E. Move the cursor to the left or right, to where the ellipse will cut the X-axis and hit E again. Now move the cursor up or down to indicate how far the minor axis will extend, hit E, and an ellipse is drawn immediately (Figure 1).

Also included are Block Move (moving a block of bytes from one address to another), Load, Save, and more, but there is not enough room here to describe them all.

The 59-page manual goes into great detail, first with 20 pages on the basics of Color Computer graphics; 20 pages of "Your First Session," which guide you through the various commands (and provide a bibliography of where to go for further information on computer graphics); a six-page command summary; and eight pages for the hard-core assembler programmer who wants to get into how *Foxygraf* works, with useful subroutines, technical data, and information on how to customize *Foxygraf*.

If you don't have Extended Color Basic, you get three bonuses: a CSAVEM routine for saving machine language programs, and line and Circle routines that are faster and more versatile than the equivalent Basic commands.

Foxygraf is great if you want to: do some creative graphics programming without having to count little squares and plot points on a grid; just draw on the screen without having to cope with PMODEs and such; understand how your "graphics machine" works so you can control it better; or develop game software with a friendly tool.

3D Drawing Board

For an extra dimension in your graphics, Computerware offer *3D Drawing Board*, with which you can easily draw high-resolution three-dimensional objects in full perspective, then rotate them, change their size, or view them from any angle. *3D Drawing Board* requires Extended Color Basic, and is $24.95 on 16K cassette, $29.95 on 32K disk.

The basic idea of *3D Drawing Board* is fairly simple. First you figure out what the major cross-sections of the object you want to draw would look like. That is, you determine the planes that define the object, either horizontally or vertically.

Then you draw the "slices," using either numerical input or joysticks. You don't draw the lines with the joysticks; you put the cursor at the beginning point (and hit P), then at the end point (and hit L), and the computer draws a line between the points.

After you have drawn the planes, you can duplicate, edit, or erase them. The next step is to connect the slices together with lines drawn either with joysticks or via numbers. Once the object is finished, you can view it from any angle or distance, using the keyboard or joysticks. With joysticks, you can quickly set four viewing parameters (size, rotation, elevation angle, and horizon angle), and just push the firing button to redraw the object in a short time.

You can store the image on cassette or disk. However, *3D Draw* has no printout command, which is a serious limitation.

If you have a 16K Color Computer, you can define an object with up to 60 connecting nodes and up to 100 connecting lines. If you have a 32K Color Computer it is 100 nodes and 300 lines.

For a quick look at what *3D Draw* can do, there is a demonstration program on the cassette or disk. Load it, and in a short time an object appears on the screen, line by line. It looks familiar; no wonder, it is a "Star Wars" tie-fighter (Figure 2). You can experiment by looking at it from different angles, making it smaller, and so on. In fact, if you photographed the screen on movie film, you could create animated sequences, maneuvering the tie-fighter all over the place.

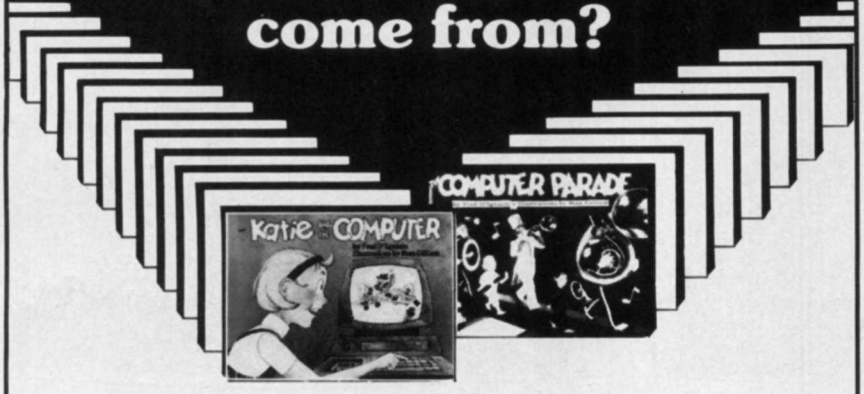
The manual says "all the input . . . you see—42 nodes and 67 connecting lines—took about ten minutes to create." Well, you *could* do it in ten minutes, if beforehand you had sketched on paper the six planes required and had a fair amount of experience with *3D Draw*.

The manual leads you through creating the simplest 3D figure—a box. You draw a rectangle, duplicate it on a second plane (which you specify as being a certain distance from the first plane), then draw four lines to connect the two planes. For an encore, you add a peaked roof. After a few tries, you can do all that in a few minutes.

If you can easily visualize three-dimensional objects, you could probably learn to use *3D Draw* in an hour or two. The 20-page manual isn't quite as easy to understand as those that come with the two Computerware programs previously mentioned; perhaps they were written by different authors. But all the infomation is there; you just have to read the manual several times until you get it.

3D Drawing Board is a fascinating program, but unless you have an

Daddy, where do microcomputers come from?



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Computer Parade is the second book in the *Katie and the Computer* series. This time Katie and her brother arrive in Cybernia just in time for a computer parade—and to learn how computer music is made. All along their fanciful journey, the threesome encounters friendly and ferocious dragons, computer bits, eeks and aaks. And of course they're always on the lookout for program bugs.

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TRS-80 Strings, continued...

architectural or mathematical turn of mind, you may find that *Semi Draw* and *Foxygraf* are more interesting and more fun.

Those Color Photographs

The color photos illustrating *Foxygraf* and *3D Draw* were taken of the screen with Kodak's Instagraphic CRT Imaging Outfit, which makes instant prints of the display on any 12 or 13" CRT.

The outfit includes a Kodak Instagraphic camera with close-up lens, two packs of film, and a "CRT cone" to hold the camera a fixed distance from the screen. Although the suggested list price is $190, The outfit is available in New York for $168.

The outfit will be described in detail later. END

Firms Mentioned In This Column

Modular Software Associates
209 18th St.
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Computerware
Box 668
Encinitas, CA 92024
(619) 436-3512

Kodak Instagraphic CRT
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"I could send you to the ball in a pumpkin carriage with mice coachmen and all that, but quite frankly, with holograms, laser generated graphics and special effects technology, I can do a pretty convincing simulation right here."

Stephen Gray

Book Reviews

The Word Processing Book: A Short Course in Computer Literacy, by Peter A. McWilliams. Prelude Press, Box 69773, Los Angeles, CA 90069. 243 pages, paperback $8.95. 1982.

This is undoubtedly the only technical book with a back-cover recommendation by William F. Buckley, Jr. ("This is a marvelous book—the first lucid account of what word processing is all about.") *And* a full-page ad for the author's books of poetry *and* a large assortment of antique etchings, including some by Doré for the "Inferno."

Despite the frivolous look of the book (which is full of old drawings whose only relevance is that many feature a book, piece of paper, or antique typewriter), it goes a long way toward exploring the mysteries of word processing and dispelling the many fears that surround it.

The 14 chapters are divided into three parts: word processing computers and what they do (history, personal computers, word processing, spelling checkers); uses of word-processing computers (office, students, writers, the self-employed, and poets); and selecting and buying a WP computer (drawbacks of WP computers, is WP for you, selecting, buying guide, buying a WP computer). The book ends with a short item about how the book was produced, a long biography of the author, an ad for his books of poetry, and addresses of the manufacturers mentioned in the book.

The author writes well, is highly informative, and comes up with some fine analogies to help beginners, such as "A good analogy between ROM and RAM is the difference between a phonograph and a cassette tape"; he goes on to explain that ROM data can't be changed, but RAM data can.

For a book dealing with a very modern, high-tech area, this one looks curiously antique, with a typeface that has a turn-of-the-century appearance, and dozens of old engravings, all on an eggshell paper that seems at least 50 years old.

But don't let any of that fool you. McWilliams has written one of the best books available for anyone who needs an introductory text on word processing.

Big Things From Little Computers: A Layperson's Guide to Personal Computing, by Dale Peterson. Prentice-Hall, Inc., Englewood Cliffs, NJ. 188 pages, paperback $12.95. 1982.

The back cover of this thin, expensive book includes rave notices by several people in the personal-computer business who call this guide "impressive," who say if you want to learn about personal computing, this is *the* book," and recommend it "to the professional and interested amateur." The back cover also promises "dozens of examples from the lives of real people," including a Wisconsin farmer, prominent anesthesiologist, biofeedback specialist, and a millionaire entrepreneur.

Well, it is a fairly good collection of information on personal computers, but there are others reviewed here during the past few months that are just as good.

The nine chapters are divided into three parts: The Past (what is a personal computer, history of computers, inside your personal computer), The Present (personal computing in school, the office, laboratory, studio, at home), and The Future (Toward the Year 2000). Three appendixes cover how to shop for a personal computer, a bibliography of books about computers (from crime to music), and a glossary.

For the $12.95, the book should include more than a few dozen photos and drawings; some of the drawings are more suited to a child's book. The author sometimes condescends to his audience, as though addressing children: "The disks look somewhat like little 45-RPM records except they are permanently packaged in little cases and are more flexible than 45s." Just as there was nothing in that sentence to indicate that data cassettes usually closely resemble audio cassettes, the paragraph on floppy disks says absolutely nothing about whay they are made of; readers may well assume they are made of vinyl or a similar plastic.

However, there are plenty of examples "from the lives of real people," which tell of all sorts of uses for computers and perhaps give readers an idea of what can be done with such machines.

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55 Advanced Computer Programs in Basic, by William Scott Watson. Tab Books Inc., Blue Ridge Summit, PA 17214. 252 pages, paperback $9.95. 1981.

The back cover promises a variety of goodies: "Now, at last, here is a source for Basic programs that are advanced enough to meet those more sophisticated needs, yet simple enough to run on an average microcomputer! . . . You will appreciate the many valuable programming hints and tips included in this volume . . . The programs themselves . . . cover both miscellaneous and specialized topics like fractional math, biorhythm cycles, decimal-to-base, and base-to-decimal conversion, metric converter," and so on, naming a bunch of programs you might have use for, and perhaps not.

A short Chapter 1 introduces the book, and says all the programs were written on a TRS-80 16K Level II computer, but "this does not exclude the users of other microcomputers," Chapter 2 provides 10 pages of "Programming Hints and Mechanical Magic": how to recover a killed program using I/O port 255, disabling the BREAK key, using the INKEY$ function, working with PEEK and POKE, how to increase speed (delete REMs, use integer variables in FOR/NEXT loops, etc.), and how to cut down memory requirements (delete unnecessary spaces, use multiple statements, and so on).

Chapter 3 briefly lists the Basic statements used, with definitions. The programs are divided into three chapters: Miscellaneous and Specialized (trig functions, metric converter, days between dates, fraction math, and so on; Business and Personal Management (depreciation, internal rate of return, present value of an annuity, and so forth); and Games and Simulations (Hangman, Tic-Tac-Toe, Soccer, and so forth). Four appendixes cover: internal codes for Basic ASCII codes, number-base

equivalents (seven pages), and reserved words in Level-II Basic.

This collection is no better and no worse than similar assortments, although few readers will have any use for Calculating Dairy Cattle Feed Rations or, for that matter, for most of the others more than once a year at most. Except perhaps the games in Chapter 6, of which there are over a dozen, including several common ones, plus Spacerace Fungus Versus the Moldmen, and Christian Versus Lion ("a rather brutal game in concept, but I like it just the same," Watson notes).

Each of the 55 programs comes with a short introduction, list of variables, suggested variations, sample run, and a full listing. Even if you use only three or four of the programs, at 18 cents each you can't go far wrong, even if you have to key them in yourself. Although, come to think of it, if you never use more than five programs from the book, that is $2 each . . .

TEXTEDIT: A Complete Word Processing System in Kit Form, by Irwin Rappaport. Wayne Green Inc., Peterborough, NH. 94 pages, paperback $9.97. 1982.

This word-processing program, written in TRS-80 Disk Basic for the Modeis I and III with TRSDOS 2.2/2.3 and 32K of memory, is said to be in "kit" form because "it is written in modules, so you can load and use only those portions that you need," according to the back cover.

Page 1 says the many advantages to kit building are that "you can take it apart with confidence, modify it more easily, have a better idea of how it works, and try out parts of it before continuing on." Included are modules for right justification, ASCII upper/lowercase conversion, one-key phrase entering, editing functions, and so on.

The first couple of chapters introduce the program features and tell how the program can be used with less than 32K, which involves massaging the text with one module after another. The book notes, "While it is easier and a little more advantageous to have the entire program resident in memory at the same time, the module system serves as a substantial RAM stretcher."

First in the kit sequence is keying in the BASE/MOD subassemblies and testing them. Then the user "constructs" NEWTEXT/MOD, merges it with BASE/MOD, and tests the two. The subsequent modules handle printing, inserting carriage returns, and editing. The author explains in detail how each module works, then tells how to use the program as an assembled unit, describes additional modules for organizing the text elements, determining line-length specifications, right-justifying, global searching, and automatic strings, and ends with UPPERLOW/AUX.

Although Rappaport writes clearly, concisely, and well, the book isn't for the neophyte because of the frequent use of computer jargon. Some phrases are explained, but the reader should be familiar with programming before taking on Textedit, which seems a fine way to learn all about how a word processor works.

Although the book doesn't mention it, a disk containing Textedit is available at $19.97 from the publisher.

I Speak Basic to My TRS-80: Student Text, by Aubrey B. Jones, Jr. Hayden Book Co., Hasbrouck Heights, NJ. 223 pages, paperback $7.45. 1982.

I Speak Basic to My TRS-80: Teacher's Manual, by Aubrey B. Jones, Jr. Hayden. 247 pages, paperback $16.20. 1982.

This computer literacy course is also available for the Apple and Pet computers and includes an exam set on spirit duplicating masters at $12.50. The course is said to require no previous computer experience on the teacher's part.

The course was developed for Project I/O, a pilot project to introduce computers to the PRIME (Philadelphia Regional Introduction for Minorities to Engineering) students in the 7th through 12th grades at Leeds Middle School.

According to the back cover, the Student Text features "learning objectives for each unit, definitions and examples of key terms and Basic concepts, in-class programming exercises and practices, and assignments."

The text moves slowly, and uses less than a third of each page (on the average) to present a couple of ideas in large (13-point) type. The 15 chapters cover the usual areas, but with some anomalies: an eight-page chapter on scientific notation, and a 19-page chapter on graphics that does no more than very briefly explain the five relevant commands, with only one to two examples on the use of each.

The Teacher's Manual includes all the material in the Student Text, and usually fills in a little (but very little) of the blank spaces with "annotations that provide a script for each classroom example." For example, after a summary on the use of the semicolon, the manual says, "Go over in detail. Give the quiz whenever you feel the class is ready for it." When programs occur, the Manual gives the teacher a lot more, explaining every line in detail, and suggests discussion of the results and program changes to illustrate various points.

The Teacher's Manual also contains seven pages on how to use the course materials (the course was developed for the Model I, which is no longer available from Radio Shack, but it can easily be used with the Model III), and 15 pages of answers for practices and quizzes. The coverage may be adequate to give students the bare essentials of Basic, although some of that empty space could better have been devoted to more examples. The course can't be recommended for use outside the computer-literacy classroom, because most readers will certainly want more depth, examples, and discussion than are provided here.

1983 Microcomputer Market Place: A Comprehensive Directory of the Microcomputer Industry. Dekotek Inc., 2248 Broadway, Suite 23, New York, NY 10024. 214 pages, paperback $75. 1982.

This directory is the first edition in a projected annual series. According to the brochure, it is for "an executive in the microcomputer software industry, a teacher or administrator, librarian, programmer, hardware manufacturer, space salesperson, computer store manager, supplier, user, or just a person interested in learning more about the computer market."

The 22 chapters provide listings of 1000 software publishers (address, phone, top executives, and (usually) how many products have been published, applications, hardware, key contact, and so on); hardware/operating systems compatibility (which company's programs are compatible with which system); business applications (software vendors in 24 areas); home applications (by type of software: budgeting, calendars, and so forth); games; preschool, elementary, high-school, college, and adult education programs; scientific programs (graphics, math routines); utility applications; special applications (agriculture, legal); 72 software distributors; 297 suppliers (peripherals, ribbons, disks); supplier index by product; 69 manufacturers of microcomputer systems; publications (63 magazines and newsletters); 16 associations; 81 software producers/developers/consultants; other services (computer typesetting, repair); and a 1983 calendar of meetings and events (24 items).

The price may seem high if you don't need such information at your fingertips; but for $75 you get a great deal of data that could take quite a while to dig up on your own all in one publication. Even if it saves you only ten hours of work, it has paid for itself. Of course, it is bound to go out of date fairly soon, but by then the 1984 edition should be available. END

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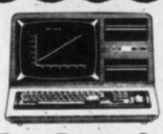

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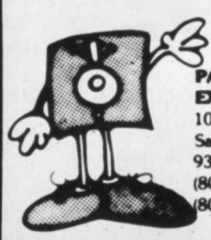

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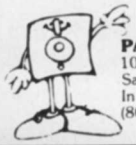

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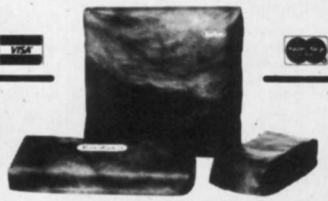

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